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Survey of Household Hazardous Wastes and Related Collection Programs

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This report summarizes the results of a study that addressed: the definition of household hazardous wastes (HHW); the quantities of HHW in the municipal waste stream; the impacts of HHW on homeowners, solid waste collection and disposal personnel, and the environment; and HHW collection programs conducted at State and local levels. A standard definition of HHW was developed and lists of household products that may be considered HHW, when discarded, are given. The criteria used for the definition and its limitations are discussed. Data is presented to show that HHW is a small percentage of all residential waste. Several instances of injuries to sanitation workers resulting from handling HHW are documented. Information on State and local HHW collection programs is given, including the benefits and problems associated with these programs.

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SECTION 1
EXECUTIVE SUMMARY

This report contains the results of the only known comprehensive nationwide study of household hazardous waste (HHW). The study was conducted to identify existing information on the types and quantities of HHW present in the residential wastestream. A proposed definition for HHW was developed when none were found (other than open-ended lists used in HHW collection programs). Existing collection programs operating at State and local levels were identified and described. Detailed lists of programs are included in an appendix as are case studies of three collection programs. This report refers to safeguards associated with waste disposal rather than the degree to which an item may injure someone or affect their health while the item is in the home.

Interest in HHW began in 1981 and 1982. Virtually all activity on this topic has been related to collection programs. These programs enlist homeowners' cooperation in taking HHW to collection centers where the wastes are identified, packaged, and transported to permitted hazardous waste disposal facilities. A major element of all programs has been public education related to identification of HHW and developing an awareness of the environmental consequences of improper disposal.

These collection programs are very similar to early recycling efforts in the 1970's. They are inspired by similar environmentally-related concerns. They rely on public cooperation and include public education elements. Overall participation is low and costs for recovery of each pound of hazardous waste are high when all costs are included.

Collection programs provide many benefits beyond the collection and disposal of HHW. All include public education elements that identify HHW. Additionally, proper ways to store the wastes are often presented along with identification of less hazardous substitutes. The potential environmental and safety impacts of improper use and disposal are also highlighted. Collection programs increase the public's awareness of HHW in the home and encourage safer use and proper disposal. Although not quantifiable at present, the public certainly is more aware of HHW and likely is disposing of these materials in more environmentally acceptable ways now than prior to collection efforts.

Current Federal regulations exempt household hazardous waste from the regulations applicable to other types of hazardous waste. Refuse from homes, apartments, motels, and hotels may contain wastes that would otherwise be considered hazardous; however, current regulations allow them to be disposed with mixed municipal (non-hazardous) waste. New attention was focused on HHW with the passage of the Hazardous and Solid Waste Amendments of 1984 (HSWA). In these amendments, Congress recognized that homes, along with small commercial generators, may be sources of hazardous constituents that have and will enter municipal sanitary landfills. The interest in the potential impact of these waste and constituents was expressed in several sections of the HSWA.

DEFINITION

During the course of this project, no rigorous definition of household hazardous wastes was found. The only approach to identifying these wastes consisted of lists of generic products used by sponsors of HHW collection programs. A definition of household hazardous wastes was developed as follows:

> Household Hazardous Wastes: Solid wastes discarded from homes or similar sources as listed in 40 CFR 261.4 (b)(1) that are either hazardous wastes as listed by EPA in 40 CFR, Parts 261.33 (e) or (f), or wastes that exhibit any of the following characteristics as defined in 40 CFR Parts 261.21 through 261.24: ignitability, corrosivity, reactivity, and EP toxicity.

Lists of household products that are hazardous or may be hazardous were prepared based on the above definition. The lists were developed without the benefit of laboratory testing. Products considered household hazardous wastes include the following:

- Drain openers
- Oven cleaners
- Wood and metal cleaners and polishes
- Automotive oil and fuel additives
- Grease and rust solvents
- Carburetor and fuel injection cleaners
- Air conditioning refrigerants
- Starter fluids
- Paint thinners
- Paint strippers and removers
- Adhesives
- Herbicides
- Pesticides
- Fungicides/wood preservatives

It should be noted that not all examples of the above products should be considered hazardous or even suspected as being hazardous. For example, some oven cleaners were considered to fail the corrosivity test while others may or may not fail that test, while still other oven cleaners would probably not fail any of the tests. The above list should not be considered complete.

PRESENCE IN WASTESTREAM

There is very little knowledge about the presence of HHW in the residential wastestream. Only three attempts at quantifying HHW have been identified. One was based on a public opinion survey and two were limited waste characterization projects. Results indicate that HHW is a small portion of all residential waste, less than 1 percent. However, the projects vary widely in their actual estimates. The public opinion survey resulted in an estimate of 1 percent (1,000 ppm), while the characterization studies indicated as little as 15 ppm. None of the quantification projects could be considered statistically valid.

IMPACTS

Limited information indicates that HHW have been found in the environment. Indirect evidence suggests that HHW contributes to ground-water contamination detected at a number of municipal disposal sites.

Although people certainly have been injured due to the presence of hazardous waste in their homes, no data were available to show a correlation. Impacts on refuse collectors and disposal personnel are easier to document. Several communities across the nation have reported injuries to sanitation workers that have been caused by HHW. These are often associated with materials that splash or spill during compaction, containers that explode, or emission of toxic fumes. Household hazardous wastes are considered as a prime suspect in fires on collection trucks or at landfills.

COLLECTION PROGRAMS

Collection programs for household hazardous waste are operated at both the local and state levels. Beginning only 3 to 4 years ago these activities have grown rapidly in popularity. A directory of 100 communities that have conducted programs is appended to this report. Nearly 200 collection programs may be operated in 1986. Collection programs have many positive attributes. Education of the public and increased awareness of the presence of hazardous materials in the home are major assets of these programs. Removal of these wastes from long term, improper storage certainly reduces the potential for injury or accident. The disposal of these wastes in permitted hazardous waste facilities reduces potential impact on the environment.

Participation rates in HHW collection programs have been low. Few programs can boast participation of even 1 percent of households in the community, and several programs report participation less than 0.2 percent. Quantities collected typically range from 20 to 40 pounds per contributing household. This may represent several years accumulation of wastes. Thus future collection efforts in the same area may result in even lower quantities per participant household, assuming the same households participate.

Unit costs for these collection programs are extremely high. Cost data are scarce and most program sponsors do not include factors for fringe benefits, overhead, and other indirect costs or donated materials or services. Relatively complete cost estimates (although based on several estimates) indicate that a well publicized program with high participation costs well over $2.00 per pound of HHW collected. Programs with limited publicity and low participation may cost over $9.00 per pound ($18,000 per ton).

SECTION 2
ANALYSIS METHODOLOGY

GENERAL PURPOSES AND PROJECT CONSTRAINTS

The overall purpose of this project was to conduct a survey of information related to the topic of household hazardous wastes (HHW). This report refers to safeguards associated with waste disposal rather than the degree to which an item may injure someone or affect their health while the item is in the home. The information collected was to be reviewed and summarized to provide general information and some specific examples of activities on this topic. The project was not intended to be a complete compilation of all information on the topic, nor a listing and discussion of all known collection or regulatory programs. Four general areas were to be addressed in the project, as follows:

- Definition - What are household hazardous wastes and how are they/could they be defined?
- Quantities - How much household hazardous waste is generated?
- Impacts - What are the safety and environmental impacts related to management of household hazardous wastes?
- Collection programs - What are some of the ways that local communities and states are regulating and collecting these wastes?

The project had some limitations and constraints. These could generally be described as funding and time. During conduct of the project it was found that interest and activities in HHW were growing rapidly. Interest at the local, state, and Federal level was expanding and more and more states were becoming interested in potential collection programs and legislation. The number of local collection programs also greatly accelerated, thus during the time frame of the project, the topic area was expanding so rapidly that the project and this resulting report could not keep pace. Information collection efforts had to cease at some point, even though new developments in the area were continually being identified.

The project was a survey, with little provision made for original research work. Thus, efforts primarily focused on the collection of existing information either through printed materials or interviews with people active in household hazardous wastes. The general purpose of the project added constraints that should be clearly identified. These may be best described as the things that the project and this report are not:

- It is not a complete discussion of (or even identification of) all state or local HHW collection programs.
- It is not a compendium of conclusions and recommendations from these collection programs.

- It is not a how-to-do-it manual to aid organizers of collection efforts.
- It is not related to impacts on health or safety in the home.

The remainder of this section is devoted to presenting the methodologies used throughout the project. It is divided generally in the same manner as the entire report. Descriptions of what was done, quality assurance (follow-up) measures that were used, and rationale are discussed.

DEFINITION

One of the purposes of the project was to develop a recommended definition for household hazardous wastes. Initial steps in this effort were the review of previously developed definitions and the EPA regulations related to HHW. Early definitions were associated with local collection programs and were found to not be true definitions, but essentially lists of household materials accepted and therefore considered hazardous. Federal regulations related to the definition of hazardous waste and the exclusion of household waste were studied to provide precedents for a definition. State regulations and definitions were not identified nor reviewed.

The definition, developed and presented in Section 3, was based on the EPA's definitions of listed and characteristic hazardous wastes in 40 CFR 261. This approach was considered consistent with the identification of hazardous wastes from commercial generators. Additionally, use of the EPA characteristics (corrosivity, reactivity, ignitability, and EP toxicity) allow the incorporation of the related tests as the criteria against which the household wastes could be tested.

In order to provide more specific examples of the definition, attempts were made to identify categories of household materials that would meet the definition. The approach involved the application of the knowledge of chemical and environmental engineers to readily available information regarding household products. Engineers visited grocery, drug, automotive, and variety stores to obtain information about the composition of products that might fit the definitions. Product labels were reviewed to identify major components of these products. The components were compared against EPA listed hazardous wastes (discarded commercial chemical products, etc.) as listed in 40 CFR 261.33. Chemical engineers applied their knowledge of the EPA characteristic tests to the known ingredients to identify those products that almost certainly or possibly would fail any one. Product labeling often provided little or no information. Commonly only one or two ingredients were listed and usually no percentage of composition was reported. This lack of label information was supplemented by chemists' knowledge of the general formulation of such products as paint thinners, drain openers, and engine additives. Where necessary, information about these ingredients was obtained through standard chemical and chemical engineering reference books.

Identification of types of household products considered hazardous was strictly based upon best scientific judgement. Funding and time constraints of the project precluded laboratory testing. Likewise, due to these constraints, no effort could be made to contact individual manufacturers of a product or group of products to determine if the products had been tested against any of the characteristic hazardous waste tests or to obtain other specific information.

The lack of information about some types of materials put them into a gray area. These materials that may be hazardous wastes are separately listed in Exhibit 3-2. This second category was necessary solely due to project constraints against actual testing. However, any testing program to completely identify all materials meeting the hazardous household wastes definition would be prohibitively expensive.

PRESENCE IN WASTESTREAM

The next major element of the project involved identification of information reporting the quantity of the household hazardous waste in residential wastes. No actual measurements of HHW quantitites were conducted in this project. Reports on previous SCS Engineers'waste composition projects were reviewed; however, no information was found in them related to specific identification of HHW.

Known leaders in HHW collection efforts were contacted for information about the presence of HHW in residential wastes. Through these contacts and attendance of an EPA-sponsored solid waste conference, three organizations were recognized as having past or present involvement with identifying these wastes. Contact was made with each to fully understand their approach. Written material was obtained from the organizations to the degree possible and was reviewed thoroughly. To acquire additional information, personnel directly involved with household waste characterization were interviewed by telephone. The limited amount of information and resultant small number of data points led to the decision to visit each of these organizations.

Interviews were conducted in person with representatives of each of the three groups. One organization was the Los Angeles County Sanitation Districts. The Districts had conducted two quantification projects that were related to identifying hazardous waste coming to disposal sites. The data were not directly related to residential sources; however, some inferences could be made.

The second organization was the Environmental Health and Energy Department of the City of Albuquerque, New Mexico. The Department had conducted a public opinion survey regarding household hazardous waste. Estimates of the types and quantities of these wastes in Albuquerque were based almost exclusively on the opinions of the residents surveyed.

The third organization was the Anthropology Department at the University of Arizona. Members of the Department have been conducting waste characterization studies for several years. In the last 2 years, household hazardous wastes have been identified and their presence has been noted in the composition studies. No quantitative data were available at the time of the interview.

Essentially no defendable data were available relating the quantities of hazardous wastes coming from homes and similar sources. The Los Angeles County and Albuquerque projects resulted in estimates that could only put the data into the broadest of perspectives. The Albuquerque data indicated household hazardous waste was likely less than 1 percent of the residential wastestream while the Los Angeles County information pointed toward a much smaller number (approximately 0.00147 percent). Although these numbers are orders of magnitude different from one another, it was inferred that they indicate that HHW are likely a small (and probably a very small) percent of the residential wastestream. The data were considered to be so tenuous that no attempt was made to project nationwide quantities.

The interest in household hazardous waste has resulted in current waste composition studies, including these waste types. The University of Arizona's Department of Anthropology is continuing its work; the resulting quantitative data should be available in the near future. Similarly, SCS Engineers is conducting a waste composition study at six locations throughout the State of Michigan. The definition of household hazardous waste developed in this report is being used and these wastes are being identified throughout the conduct of this project. These data will also likely be available at the conclusion of the Michigan project.

IMPACT ON SOLID WASTE MANAGEMENT

Collection of information related to the impacts of household hazardous waste on overall solid waste management, and on the environment, as well as information about the HHW collection programs was initially obtained through a series of telephone contacts. Organizational leaders of collection programs were contacted and requests made for any reports related to the topic. Program sponsors and others involved with household hazardous waste enthusiastically responded providing reports and also providing the names and telephone numbers of other involved individuals. This approach of contacting one person, obtaining the information that they had available, and then asking for another lead was used with good success. Frequently, project interviewers were directed back to a small group of key individuals. After a number of telephone contacts, fewer and fewer new names were being added to the list. This indicated that the truly significant individuals in the area of household hazardous wastes nationwide had been contacted.

The reports and other written information as well as information provided verbally was reviewed. Any reports that associated household hazardous waste with injuries or other impacts on homeowners, sanitation workers, or on the environment were noted. Follow-up telephone calls were used in some instances to clarify the written materials and to provide details and up-to-the-minute interpretations.

Information on environmental impacts was particularly scarce. Telephone contacts with authors or others identified in these reports were used to obtain all pertinent information. Even then only a very small number of reports associated with potential environmental impacts could be identified. This is likely because there appears to be no nationwide reporting network, nor any other organized means of identifying environmental, safety, or health impacts associated with household hazardous wastes.

LOCAL AND STATE COLLECTION PROGRAMS AND CASE STUDIES

Initial efforts of information collection focused on obtaining as many written reports, news articles, and similar items as possible. Often this included the names of people actively involved with household hazardous waste collection efforts. Key individuals were contacted by telephone to obtain more detailed information about specific programs. The information collection effort identified the rapidly changing and growing nature of household hazardous waste programs. The number of states and communities interested in this topic seem to be growing exponentially. Thus, information about every state program and all the variations on local collection efforts could not be included. Consequently, for this report, early state and local programs were selected to provide some insight related to the history of interest in this topic. Similarly, programs that represented typical approaches were highlighted and described in order to provide information about the majority of these efforts.

Detailed case studies of three programs were developed. One state program (Florida) and two local collection programs (Albuquerque, NM and Fairfax County, VA) were prepared. The Florida case study was based on written reports and extensive telephone contact supplemented by collection of population data for Florida that were used in estimating participation rates.

The two local collection program case studies involved direct observation of the collection efforts. Project personnel coordinated with Albuquerque and Fairfax County staff. All available written materials were obtained and reviewed prior to the site visits. During the collection efforts, project personnel were on hand to observe all aspects. Data were obtained from project sponsors as available regarding numbers of participants, quantities of waste collected, results of public opinion surveys, and program costs. In some instances, these data were not available or only partially supplied. Best engineering economic judgement was used to estimate missing cost elements.

Efforts were made to include estimates for all elements of the case study collection programs. This included items that are often not considered, especially when a governmental organization is involved. Therefore, estimates were included for cost factors such as personnel overhead and fringe benefits and the reasonable value of donated services and equipment.

A major weakness in the evaluation of the two local case studies and other local programs is the lack of information concerning the effectiveness and impact of public education. Public education is a major element of all household hazardous waste collection programs. It certainly contributes to the participation in the collection effort itself, and the degree of participation is one measure of its effectiveness. However, there are many more, potentially far-reaching benefits from these educational efforts. These benefits include: safer management of household products prior to disposal; shifts in buying habits from hazardous products to those that are non-hazardous; and a general increased awareness of the environmental impact of home activities. Review of information regarding the case study locations and contacts with other program sponsors nationwide indicated that there was no known effort to assess these less tangible benefits.

SUMMARY

The methodology of this project essentially consisted of collecting currently available published and unpublished information on the topic of household hazardous waste. Scientific judgement was applied to EPA regulations resulting in a definition of household hazardous waste. Knowledge of chemistry was used to evaluate numerous types of household products to identify which groups should be included in the category. No testing was possible due to funding and time constraints.

Similarly, existing information was collected and reported as it related to the impact of household hazardous waste and the approaches used to improve their management and collection. Information available from written reports and collected through the conduct of case studies was used to develop estimates of quantifiable aspects of these programs such as participation rates, quantities recovered per participant, and collection costs. Non-quantifiable benefits were only identified.

SECTION 3
DEFINITIONS

BACKGROUND

What are household hazardous wastes? The Environmental Protection Agency (EPA) has not officially or completely defined the term in any regulations or publications to date. Materials that are excluded from regulation as hazardous wastes are identified in 40 CFR 261.4. One category is identified as household waste. The regulations define household waste as including any waste materials derived from households, including single and multiple residences, hotels, motels, and other similar sources (40 CFR 261.4 (b)(1)). In the preamble to the proposed hazardous waste regulations, EPA stated that "this exemption is based on Congressional intent to exempt from the hazardous waste regulations those wastes generated by consumers in their households, and not on the absence of hazard from the waste." In fact, in the preamble to its final rule, EPA stated that it was not attempting to pass judgement on the health and environmental risks associated with these wastes.

On a related topic, the Agency discusses residues of hazardous waste in empty containers (40 CFR 261.7). That regulation indicates that hazardous wastes remaining in "empty" containers (residues up to one inch deep in the bottom of the container) are not subject to regulation under Parts 261 through 265 and other parts of 40 CFR associated with the management of hazardous waste. Thus, no regulations identify any household wastes as being hazardous requiring regulated management from the point of generation through transportation and on to final disposal at a permitted hazardous waste facility.

However, several commonly-used household products would be classified as hazardous wastes if they were generated by a commercial operation that exceeded the small quantity generator limitation (i.e. less than 100 kg per month). In other words, these materials are legally not hazardous because they are generated in homes and in locations very similar to homes such as hotels and motels. The same materials discarded from a large manufacturing or commercial facility would be hazardous wastes and subject to all EPA RCRA Subtitle C regulatory requirements.

Several organizations have attempted to define household hazardous wastes (HHW) by listing items considered hazardous. These efforts have most commonly been associated with community efforts to collect hazardous wastes from homeowners. During these programs, which are discussed in more detail later in this report, organizing personnel have used their best judgement and that of preceeding similar programs to identify, for potential participants, those types of household items considered hazardous. These lists or definitions often may have been developed primarily to collect materials that could be harmful to homeowners with secondary considerations given to environmental protection.

Impressions of what household items are and are not hazardous vary widely. Householders often are ignorant of or underestimate the types and quantities of hazardous waste generated in homes. The City of Albuquerque conducted a house-to-house residential survey in 1982. A total of 386 households were visited to determine public awareness of HHW (1). One of the initial questions requested the respondent to name as many different types of HHW as possible. Twelve percent could not name any and therefore apparently felt that no household items were considered hazardous. Forty percent of the respondents could not name more than one type of material. In a follow-on question, the respondents were asked to indicate the degree of hazard presented by specific named types of household items. In addition to wastes such as drain openers and paint thinner, the list included shampoo, mouthwash, and sawdust. At least 1 percent of homeowners identified these three items as extremely hazardous; while three percent said poisons and pesticides were not hazardous.

Until now, there has been no known attempt to write a definition of a household hazardous waste. The lists developed by organizations conducting collection programs are a form of definition; however, they vary from place to place and at best are educated guesses as to what materials should be included in the universe of household hazardous waste. Although use of the listing approach expedites identification of the wastes, providing helpful service to the homeowners, it does not address the generic definition of household hazardous waste. In this report, development of such a definition is necessary to understand the nature and scope of household hazardous waste management.

DEFINITION OF HOUSEHOLD HAZARDOUS WASTES

In an attempt to define hazardous materials that could be disposed by households, a fairly thorough investigation of products and their ingredients was performed. This investigation consisted of visits to supermarkets, drug stores, variety stores, and specialty stores (e.g., automotive supply, photo supply) followed by qualitative evaluations by chemical and environmental engineers. Laboratory testing was not performed because the wide range of products and constituents would require a prohibitively expensive testing program. Results of the investigation indicated that commercial products generally fall into one of the following three categories:

- Items that are obviously hazardous;
- Items that are suspected to be hazardous; or
- Items that are obviously non-hazardous.

A definition of household hazardous waste was developed primarily based on the EPA definition of household waste and the EPA classifications of hazardous waste in the Resource Conservation and Recovery Act (RCRA) and associated regulations. The definition is as follows:

> Household Hazardous Wastes: Solid wastes discarded from homes or similar sources as listed in 40 CFR 261.4 (b)(1) that are either hazardous wastes as listed by EPA in 40 CFR, Parts 261.33 (e) or (f), or wastes that exhibit any of the following characteristics as defined

in 40 CFR Parts 261.21 through 261.24: ignitability, corrosivity, reactivity, and EP toxicity.

The following section discusses the criteria for household hazardous wastes and presents examples of products that meet the above definition. Note that the above definition is based solely on Federal regulations and definitions. States may have more stringent regulations. In those situations, any existing local regulations and/or definitions should be applied.

CRITERIA FOR HOUSEHOLD HAZARDOUS WASTES

As stated in the definition, a household waste is considered hazardous if it is a listed hazardous waste (discarded commercial product, etc.) or if it exhibits any of four hazardous characteristics. The applicable hazardous waste lists appear in 40 CFR Parts 261.33 (e) and (f). Copies of the lists are included as Apendix A. Compounds appearing in 40 CFR 261.33 (e) have been listed by EPA because of their acute toxicity, unless otherwise indicated on the list by the letters T (toxicity) or R (reactivity). This list is commonly referred to as the "acute" list or the "P" list because the hazardous waste number for each of the compounds begins with the letter P.

Compounds appearing in 40 CFR 261.33 (f) are listed for toxicity unless otherwise designated. This is commonly referred to as the "U" list because the hazardous waste number for each of these materials begins with the letter U.

In accordance with the guidelines for hazardous wastes (see comment following 40 CFR 261.33 (d)), a household waste is hazardous if "it consists of the commercially pure grade" of a compound appearing on the P list or U list, or if it consists of "any technical grades of the chemical that are produced or marketed", or if it is a "formulation in which the chemical is the sole active ingredient." This is particularly applicable to pesticides and herbicides. While these products can be distributed in relatively concentrated forms for industrial purposes, the commercial formulations purchased by the homeowner are often diluted. Because the pesticides are the sole active ingredients in the diluted formulations, these products are considered household hazardous wastes. If a product contains a listed chemical, but this chemical is not the sole active ingredient, then the product is not considered hazardous (unless the product also exhibits any of the characteristics).

The four characteristics that can result in a waste being considered hazardous are ignitability, corrosivity, reactivity, and EP toxicity. EPA has developed definitions for each of these characteristics. These definitions primarily specify standard test methods to be used to determine if a waste exhibits one of the characteristics. Appendix B contains the EPA definitions of these properties from 40 CFR Parts 261.21 through 261.24. A waste exhibiting any of these properties is commonly called a "characteristic" hazardous waste. Products exhibiting these characteristics often display warnings on the labels such as "flammable", "combustable", "poison", "skin and eye irritant", "injurious to eyes and skin", "harmful if swallowed", etc. The lack of such a label, however, is no guarantee that the product is non-hazardous.

Exhibit 3-1 presents the generic types of wastes that can be considered hazardous in accordance with the definition and information about the constituents that make them hazardous. If the product appears in Exhibit 3-1 because it exhibits one of the four characteristic properties, the characteristic that caused the product to be classified as hazardous is indicated. If a product is considered hazardous because it is composed of a listed compound, that is also noted in Exhibit 3-1.

While the generic types of products appearing in Exhibit 3-1 are those that are most often hazardous, exceptions may exist. For example, the majority of oven cleaners are hazardous due to their corrosivity. A few specific types of oven cleaners, however, are composed of compounds that are either not corrosive or are not present in sufficient concentration such that the commercial product is corrosive in accordance with the EPA definition. These products are the exception and not the rule. Exhibit 3-1 should not be considered a complete list of the types of products that meet the definition of household hazardous waste. Project schedule and funding limitations precluded actual testing of any product, let alone all oven cleaners, etc.

In addition to the generic classifications, e.g. drain openers, or oven cleaners, the specific chemical ingredient(s) that cause the waste to be hazardous are identified in Exhibit 3-1. Also included are the specific hazardous waste numbers for compounds appearing on the P list or U list, and/or the property that causes the compound to be a characteristic waste (i.e, ignitability, reactivity, corrosivity, or EP toxicity).

It must be realized that not all of the components listed in Exhibit 3-1 under a specific generic product type will exist in every product of that type. For example, not every paint thinner contains all nine components listed under the paint thinner category. The listed components are all ignitable compounds that have been found in one or more of a variety of paint thinners. Each of the listed compounds that are components of particular brand(s) of paint thinner will contribute to the ignitability of the product. Sufficient quantities of the components exist in most paint thinners that the mixture (the product) is ignitable.

In reviewing the results of the product survey, it was found that many products contain compounds that, when pure, would undoubtedly be considered characteristic hazardous wastes. When these compounds are sufficiently diluted, they no longer meet the criteria (e.g., pH for corrosivity, flash point for ignitability) set forth in the EPA definitions. Unfortunately, few commercial products list complete compositions, including both the components and percentages. Usually, the label either lists components in descending order of concentration (without giving the concentration), lists only the primary components, or lists no information at all. There are many products that may be characteristic hazardous wastes because of the components that are listed on product labels or are commonly known to be ingredients. It is uncertain, however, if these components are present in sufficient concentration for the product to be hazardous. Exhibit 3-2 lists the generic types of wastes that fall into this category, and the characteristic(s) that they may exhibit. Exhibit 3-2 also provides the characteristic components that are likely present in sufficient concentration such that the product may be a hazardous waste.

EXHIBIT 3-1. HOUSEHOLD HAZARDOUS WASTES AND THEIR HAZARDOUS COMPONENTS

I. **HOUSEHOLD CLEANERS**

A. Drain Openers; (C)*

1. Sodium Hydroxide; Lye; Caustic Soda; (C)

B. Oven Cleaners; (C)

1. Sodium Hydroxide; Lye; Caustic Soda; (C)

C. Wood and Metal Cleaners and Polishes; (I)

1. Petroleum Distillates; (I)
2. Petroleum Naptha; (I)
3. Turpentine; (I)
4. Isopropyl Alcohol; Isopropanol; (I)

II. **AUTOMOTIVE PRODUCTS**

A. Oil and Fuel Additives; (I)

1. Xylene; Xylol, Dimethylbenzene; (I), (U239)
2. Petroleum Distillates; (I)
3. Mineral Spirits; (I)
4. Methyl Alcohol; Methanol; (I), (U154)
5. Ethyl Ether; (I), (U117)
6. Secondary Butly Alcohol; Secondary Butanol; (I)

B. Grease and Rust Solvents; (I)

1. Petroleum Distillates; (I)
2. Cresylic Acid; Cresol; (I), (U052)

C. Carburetor and Fuel Injection Cleaners; (I)

1. Toluene; Toluol; (I), (U220)
2. Methyl Ethyl Ketone; MEK; Butanone; (I,T), (U159)
3. Methanol; Methyl Alcohol; (I), (U154)
4. Methyl Chloride; Chloromethane; (I,T), (U045)
5. Xylene; Xylol; Dimethylbenzene; (I), (U239)
6. Acetone; (I), (U002)
7. Diacetone Alcohol; (I)

D. Air Conditioning Refrigerants; (Listed)

1. Freon 12; Dichlorodifluoromethane; (U075)

II. AUTOMOTIVE PRODUCTS (continued)

E. Starter Fluids; (I or Listed)

1. Petroleum Distillates; (I)
2. Ethyl Ether; (I), (U117)

III. HOME MAINTENANCE AND IMPROVEMENT PRODUCTS

A. Paint Thinners; (I)

1. Mineral Spirits; (I)
2. Acetone; (I), (U002)
3. Petroleum Distillates; (I)
4. Methanol; Methyl Alcohol; (I), (U154)
5. Toluene; Toluol; (I), (U220)
6. Methyl Ethyl Ketone; MEK; Butanone; (I,T), (U159)
7. Turpentine; (I)
8. Isopropyl Alcohol; Isopropanol; (I)
9. Methyl Isobutyl Ketone; Isopropylacetone; (I), (U161)

B. Paint Strippers and Removers; (I)

1. Acetone; (I), (U002)
2. Toluene; Toluol; (I), (U220)
3. Petroleum Distillates; (I)
4. Methanol; Methyl Alcohol; (I)

C. Adhesives; (I)

1. Methyl Ethyl Ketone; MEK; Butanone; (I), (U159)
2. Petroleum Distillates; (I)
3. Acetone; (I) (U002)
4. Butyl Acetate, (I)
5. Mineral Spirits; (I)
6. Xylene, Xylol; Dimethylbenzene; (I), (U239)
7. Petroleum Naptha; (I)
8. Tetrahydrofuran; (I), (U213)
9. Isobutylacetate; (I)
10. Toluene; Toluol; (I), (U220)
11. Acyrlic Acid; (I), (U008)
12. Hexane; n-Hexane; (I)
13. Allyl isothiocyanate; Allyl isosulfocyanate; mustard oil; (I)
14. Cyclohexane; (I) (U056)
15. Formaldehyde; (I), (U122)
16. Ethylene dichloride; 1,2-dichloroethane; (I), (U077)
17. Ethylidene Dichloride; 1,1,-Dichloroethane; (I), (U076)

EXHIBIT 3-1 (Continued)

IV. LAWN AND GARDEN PRODUCTS

A. Herbicides; (E or Listed)

1. 2,4-D: (E), (D016)
2. Silvex; (U233)
3. 2,4,5-T; (U232)

B. Pesticides; (E or Listed)

1. Acrolein; (P003)
2. Aldicarb; (P007)
3. Aldrin; (P004)
4. Arsenic Acid; (P010)
5. Aziridine; Ehyleneimine; (P054)
6. Chlordane; (U036)
7. Creosote; (U051)
8. 2,4-D; (E), (D016)
9. DDD; (U060)
10. DDT; (U061)
11. Dieldrin; (P037)
12. Dimethoate; (P044)
13. Dinoseb; (P020)
14. Disulfoton; (P039)
15. Endosulfan; (P050)
16. Endrin; (P051)
17. Heptachlor; (P059)
18. Lindane; (U129)
19. Methoxychlor; (U247)
20. Methyl Parathion; (P071)
21. Parathion; (P089)
22. Pentachlorophenol; (U242)
23. Phorate: (P094)
24. Silvex; (U233)
25. 2,4,5-T; (U232)
26. Toxaphene; (P123)
27. Trichlorophenol; (U230, U231)
28. Warfarin; (P001)

EXHIBIT 3-1 (Continued)

C. Fungicides/Wood Preservatives; (Listed)

1. Pentachlorophenol; (U242)
2. Trichlorophenol; (U230, U231)

*I: Ignitable per 40 CFR Part 261.21

C: Corrosive per 40 CFR Part 261.22

E: EP Toxic per 40 CFR Part 261.24

Listed: Listed in 40 CFR Part 261.33 (e) or (f)

D###: EPA hazardous waste number for a specific constitutent failing the EP Toxicity Test, per 40 CFR Part 261.24

P###: EPA hazardous waste number for a specific acute hazardous waste appearing in 40 CFR Part 261.33 (e)

U###: EPA hazardous waste number for a specific hazardous waste appearing in 40 CFR Part 261.33 (f)

Note: Components listed must be present to such a degree that they result in the failure of a characteristic test by the generic item.

Important Note: Not all examples of any generic type shown above are considered hazardous household wastes, e.g. some oven cleaners will not fail the corrosivity test.

EXHIBIT 3-2. OTHER HOUSEHOLD ITEMS THAT MAY BE HAZARDOUS

I. **HOUSEHOLD CLEANERS**

- A. Drain Openers; (C)*
  1. Sodium Hydroxide; Lye; Caustic Soda; (C)
  2. Potassium Hydroxide; (C)
  3. Sulfuric Acid; (C)
  4. Hydrogen Chloride; Hydrochloric Acid; Muriatic Acid; (C)
- B. Oven Cleaners; (C)
  1. Sodium Hydroxide; Lye; Caustic Soda; (C)
- C. Toilet Bowl Cleaners (C)
  1. Hydrogen Chloride, Hydrochloric Acid; Muriatic Acid; (C)
  2. Sodium Acid Sulfate; (C)
- D. General Purpose Cleaners; (C or I)
  1. Oxalic Acid; (C)
  2. Sodium Hydroxide; (C)
  3. Ethyl Alcohol; (I)
- E. Disinfectants; (C or I)
  1. Sodium Salt of O-phenyl phenol; Dowicide A; Natriphene; (C)
  2. Pine Oil; (I)
  3. Isopropyl Alcohol; Isopropanol; (I)
  4. Ethanol; Ethyl Alcohol; (I)

II. **AUTOMOTIVE PRODUCTS**

- A. Lubricating Fluids; (I or E)
  1. Petroleum Distillates; (I)
  2. Lead; (E)
- B. Radiator Fluids and Additives
  1. Morpholine; Tetrahydro-1,4-oxazine; (I)

EXHIBIT 3-2 (Continued)

II. AUTOMOTIVE PRODUCTS (Continued)

C. Waxes, Polishes and Cleaners; (I or C)

1. Petroleum Distillates; (I)
2. Phosphoric Acid; (C)

D. Grease and Rust Solvents; (C)

1. Phosphoric Acid; (C)
2. Potassium Hydroxide; Caustic Potash; (C)

E. Body Putty; (I)

1. Toluene; Toluol; (I), (U220)
2. Butyl Acetate; (I)
3. Styrene; Vinyl Benzene; (I)

F. Transmission Additives; (I)

1. Xylene; Xylol; Dimethylbenzene; (I)

III. HOME MAINTENANCE AND IMPROVEMENT PRODUCTS

A. Paints; (I)

1. Xylene; Xylol; Dimethylbenzene; (I), (U239)
2. Toluene; Toluol; (I), (U220)
3. Propane; (I)
4. Vinyl Acetate; (I)
5. Amyl Acetate; (I)
6. Vinyl Toluene; Methyl Styrene; (I)

B. Paint Removers and Strippers; (C)

1. Hydrogen Chloride; Hydrochloric Acid; Muriatic Acid; (C)

C. Stains, Varnishes, and Sealants; (I)

1. Mineral Spirits; (I)
2. Petroleum Distillates; (I)

IV. MISCELLANEOUS

A. Batteries; (C or E)

1. Sulfuric Acid; (C)
2. Mercury; (E)
3. Mercuric Oxide; (E)
4. Potassium Hydroxide; (C)
5. Sodium Hydroxide; (C)
6. Silver Oxide; (E)
7. Silver; (E)
8. Lead; (E)
9. Lead Peroxide; (E)
10. Lead sulfate; (E)

B. Fingernail Polish Removers; (I)

1. Acetone; (I), (U002)
2. Ethyl Acetate; (I), (U112)

C. Pool Chemicals; (R)

1. Sodium Dichloro-S-triazinetrione; (R)

D. Photo Processing Chemicals; (E, C, or I)

1. Silver; (E)
2. Selenium; (E)
3. Sulfuric Acid; (C)
4. Heptane; (I)

E. Electronic Items; (E)

1. Electrical Solder
    a. Lead; (E)
    b. Silver; (E)
2. Switches
    a. Mercury; (E)

EXHIBIT 3-2 (Continued)

IV. MISCELLANEOUS (Continued)

E. Electronic Items; (E) (Continued)

3. Floodlights

a. Mercury Vapor; (E)

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*I: Ignitable per 40 CFR Part 261.21
C: Corrosive per 40 CFR Part 261.22
E: EP Toxic per 40 CFR Part 261.24
R: Reactive per 40 CFR Part 261-23
U###: EPA hazardous waste number for a specific hazardous waste appearing in 40 CFR Part 261.33 (f)

Note: Components listed are examples of those likely to be found in each generic type of item. The percentages of these components in these items vary from one brand to another and thus the components may result in the item being hazardous. However not all examples of each generic type listed contain the listed components (or other hazardous components) and these examples would not likely fail any of the characteristic tests.

Again, there will be exceptions to the products listed in Exhibits 3-2. For example, not all general purpose cleaners are considered to be household hazardous wastes. Also, not all general purpose cleaners containing oxalic acid are corrosive. Some of these cleaners, however, may contain oxalic acid in sufficient concentrations that they are corrosive according to the EPA definition. Since product labels seldom give the percentages of these ingredients, a cleaner containing an unknown concentration of oxalic acid may be a household hazardous waste. In most cases where the product label supplies the composition, a more reliable decision can be made as to whether the waste exhibits any of the characteristics.

A review of Exhibits 3-1 and 3-2 indicates that there is some overlap. Some drain openers, for example, are known to contain sufficient sodium hydroxide to be corrosive. This is known because the label gives the composition. This type of product is a household hazardous waste (Exhibit 3-1). Other drain openers list sodium hydroxide, and a variety of other corrosive ingredients, but do not provide content percentages. Accordingly, these appear on the list of items that may be hazardous, (Exhibit 3-2).

These exhibits should not be considered exhaustive lists of hazardous or possibly hazardous household wastes. They are based on the best judgement of chemical and environmental engineers, the results of the product component survey, and on the properties of these components.

OTHER DEFINITIONS OF HOUSEHOLD HAZARDOUS WASTES

Several definitions of household hazardous wastes have been developed by the organizations conducting waste surveys or operating HHW collection programs. Invariably, these definitions are in the form of lists. The lists usually include generic types of materials followed by specific examples. Additionally, the collection programs often include a list of materials that are not accepted. These lists of non-acceptable items are often developed to reduce the potential danger to the personnel conducting the program and to the homeowners transporting the materials to the collection center. Materials usually excluded are explosives, gas cylinders, and unknown materials.

Exhibit 3-3 contains lists of generic household hazardous wastes and a few examples as identified by organizations conducting household hazardous waste surveys. The definitions contain virtually the same generic types of materials. These are related to household cleaning and maintenance, automotive products, paint products, pesticides, and miscellaneous products. The University of Arizona and the Los Angeles County lists (definitions) are very similar to one another and are the most comprehensive of the first four shown. They both were used in waste composition studies. The thrust of the Los Angeles County survey was primarily to identify industrial or commerical-type products that might be hazardous. Some of the specific items identified were not actually considered hazardous, e.g., suntan oil and skin cream, by the Sanitation Districts. The Albuquerque list was used in a house-to-house survey and not in a waste composition study. The Mother Earth News list was developed primarily to advise its readers of potential chemical dangers to human health in the home. It was not directed toward wastes and it was restricted to

EXHIBIT 3-3. COMPARISON OF HOUSEHOLD HAZARDOUS WASTE LISTS

University of Arizona (1)	Los Angeles County, CA Sanitation Dist. (2)	City of Albuquerque, NM (3)	Mother Earth News (4)	Wastes Listed in Exhibit 3-2 and Markedly Different from U of Az or LA County Lists
Household and Laundry Cleaners and Maintenance - toilet bowl cleaners - drain openers - laundry and dish cleaners - furniture, floor, and metal cleaners and polish - oven cleaner Automotive Maintenance - oil - anti-freeze - engine treatments - degreasers and solvents Paint and Glue - oil-based paint and thinner - stains - glue - solvents and paint removers Plant, Yard and Pet - fertilizers - pesticides and herbicides Other - batteries - nail polish and remover	Household and Cleaning Products - bleach - drain opener - window cleaners - metal polish - oven cleaner - charcoal lighter - glue Automotive Products - motor oil - oil filters - radiator sealers - anti-freeze - brake fluid Paint Products - paint - paint thinner Insecticides, Pesticides Herbicides - insect sprays - germicides - weed killers Personal Item. - butane fuel - hair spray - suntan oil - deodorant Other - Freon 12 - peroxide	Household Products - cleaners - polishes - drain openers - glue Automotive - motor oil - anti-freeze Paint Products - paints - solvents and thinners Plant, Yard and Pet - weed killers - fertilizers - pesticides - poisons Personal Items - shampoo * - mouthwash * Other - sawdust *	Utility Room - drain, toilet bowl and window cleaners - oven cleaners - laundry products - pesticides - shoe care products - furniture polish - refrigerants Kitchen - preservatives - emulsifiers - flavoring/colorings - pots and pans - dinnerware Bathroom - medications - cosmetics (included in original article) Living Room - asbestos - formaldehyde - radon gas - vinyl chloride	Household Products - disinfectants Automotive - waxes, polishes, and cleaners - transmission additives Paint Products - latex paints, probably not hazardous Personal Items - items containing alcohol or other flammables Other - swimming pool chemicals - photo processing chemicals - electronic items

* These items put into survey form as "ringers", see text (4-9).

Sources:

1. Hazardous Ingredients in Common Household Products, Department of Anthropology, University of Arizona, Tucson, AZ, undated.
2. Hand Sorting Fact Sheet, Solid Waste Management Department, County Sanitation Districts of Los Angeles County, Whittier, CA, 1979.
3. Residential Hazardous/Toxic Waste Survey, Environmental Health and Energy Department, City of Albuquerque, NM, 1983.
4. Excerpted from, Mother's Guide to Hazardous Substances, The Mother Earth News, May/June 1984.

materials in the home not including maintenance, hobby, or yard-related items. Interestingly, it did identify constituents of building materials, such as asbestos, as being hazardous.

It is interesting to note some of the items that were excluded from these lists. Of the three survey programs, none specifically identified swimming pool chemicals as a hazardous waste even though these areas certainly have many home swimming pools. Similarly, none specified photographic chemicals or electronic equipment. These three types of materials were likely excluded because they were overlooked rather than because they were consciously identified and then judged not to be hazardous. Exclusion through neglect is common when definitions are developed through the use of lists or examples. This should not be considered a major defect of the survey programs and merely identifies a weakness in the entire topic area of household hazardous waste. It is primarily due to the fact that researchers or other organizations have become involved with the topic independent of one another. While the resultant definitions generally concur with one another there are some differences primarily related to those types of materials that have been excluded just because they were not considered as candidates.

Probably the most surprising group of materials to be included in most of the lists are selected personal care items. It is unusual to think of materials that are applied directly to the body as being hazardous. However through reviewing product labels and through other research, some personal care items have been listed and included in Exhibit 3-2. The inclusion of personal care items is most often due to the presence of sufficient amounts of alcohols (or other flammable volatiles) so that the product is considered ignitable. Fingernail polish and polish remover were identified as a hazardous waste by the University of Arizona. In its house-to-house survey, the City of Albuquerque, New Mexico included mouthwash and shampoo with at least a few respondents considering these items as hazardous to one degree or another and a small number even considered these to be extremely hazardous.

The last column in Exhibit 3-3 relates the list in Exhibit 3-2 to the University of Arizona and Los Angeles County lists. The last column indicates additional types household items that may be hazardous wastes, primarily in the areas of Automotive Products and the Other category. The only deletion suggested in the last column is latex paints. Some surveys and possibly some collection programs identify latex paints as hazardous. However, collection programs usually do not accept latex paints because they are not likely hazardous.

The types of wastes accepted during selected collection programs are listed in Exhibit 3-4. Invariably, these lists are shorter than the lists shown in Exhibit 3-3. The lists may be shorter because they were primarily developed by program sponsors who were not technically oriented or did not have access to the survey lists shown in Exhibit 3-3.

Most collection program sponsors indicate that they will accept nearly anything that is delivered. Usually the collection programs are operated by professional hazardous waste personnel who are capable of identifying and

EXHIBIT 3-4

EXAMPLE WASTES IDENTIFIED FOR COMMUNITY COLLECTION DAY PROGRAMS

Fairfax County, Virginia	Albuquerque, New Mexico	Andover, Massachusetts
Solvents, spot removers	Cleaning fluids, bleach, ammonia	Furniture Polish and strippers
Pesticides	Solvents	Paints and thinners
Oil-based paints and thinners	Insecticides, herbicides, fungicides	Solvents
Wood preservatives	Paint, thinner, stripper	Pesticides, herbicides
Pool and photo chemicals	Wood preservatives	Fertilizer
Chemistry sets	Brake Fluid, anti-freeze	Waste oil
Flammable liquids including gasoline and kerosene	Swimming pool chemicals	Photo chemicals
	Anything else you would not want your child to get into.	
Exclusions	Exclusions	Exlusions
- Latex paints - Explosives - Biologically active wastes - Radioactive wastes - Gas Cylinders - Asbestos - Waste oil - Unkowns	- Motor oil: direct to recycling locations - Biologicals - Explosives - Asbestos	- None identified

properly handling a wide variety of waste materials. Wastes that are obviously nonhazardous are collected together and hauled to the municipal disposal site.

REFERENCES

1. Residential Hazardous/Toxic Waste Survey, City of Albuquerque Environmental Health and Energy Department, Albuquerque, NM, 1983.

2. Stecher, P.G., Finkel, M.J., Siegmund, O.H., Szafranski, B.M., Editors, The Merck Index of Chemicals and Drums, Seventh Edition, Merck & Co., Inc. , Rahway, N.J., 1960.

3. Weast, R.C., Editor, CRC Handbook of Chemistry and Physics, 60th Edition CRC Press, Inc., Boca Raton, Florida, 1979.

4. National Fire Protection Association, Fire Protection Guide on Hazardous Materials, Seventh Edition, 1978, Sections FPI, 325M, and 49.

5. Hammer, W., Occupational Safety Management and Engineering, Second Edition, Prentice Hall, Inc., Englewood Cliffs, N.J., 1981, page 402.

6. Mother's Guide to Hazardous Household Substances, The Mother Earth News, May/June 1984.

7. SCS Engineers, Disposal of Dilute Pesticide Solutions, EPA Contract No. 68-01-4729, November 1978, pages 8-10, 23, 49.

8. Davidson, J.M. et al., University of Florida, EPA-600/2-80-124: Adsorption, Movement, and Biological Degradation of Large Concentrations of Selected Pesticides in Soils, Grant No. R803849, August 1980, page 10.

9. SCS Engineers, Selected Biodegradation Techniques for Treatment and/or Ultimate Disposal of Organic Materials, EPA Contract No. 68-03-2479, March 1979, page 348.

SECTION 4
PRESENCE IN WASTESTREAM

RESIDENTIAL WASTE GENERATION AND COMPOSITION

Generation Rates

How much solid waste does each person generate every day and what is the composition of that waste? These questions have been asked since the early 1970's and even before when interest in solid waste management increased dramatically. To this day, neither question has been answered completely or conclusively. To answer these questions, much work remains to be done. Reasons for ambiguous or differing answers include the fact that there is no "standard" definition of residential wastes and the fact that refuse composition varies from one season to the next. Similarly, there have been changes in waste generation practices over the past 10 to 15 years that likely have impacted on the amount and types of waste discarded.

Estimates of waste generation rates have varied widely. In the early 1970's, a commonly used figure was 5 pounds per person per day. This figure was quickly found to be too large. It probably included all solid waste collected in a community divided by the population of that community. The waste quantity thus included industrial and commercial as well as the residential refuse. Other estimates of residential waste generation rates fall to 1 pound per person per day.

A primary difficulty in the estimation of waste generation rates is defining what types of waste should and should not be included. All solid wastes generated by householders should be included. Using that definition, several types of wastes would be counted that normally would be excluded from consideration. These include: garbage that is disposed by garbage grinders; wastes that are disposed of on the owners' property such as grass clippings, leaves, and composted materials; and waste materials that are source separated for recycling. Bulky wastes such as furniture and appliances that require special collection also should be included.

For purposes of this report, the wastes of concern should include all those normally collected by municipal or private haulers and disposed in sanitary landfills or through similar means. Essentially, this means that the residential wastestream is whatever is put out in the trash can. Even this varies across the country and throughout the year. Yard trimmings is a type of waste with great variability. Locations in the South generate much more yard waste than in other parts of the country. Around the year, there are changes in waste generation rates. Summer is normally the time with highest waste generation due to landscaping work and a general higher level of recreational and other activities. Thus, any survey to estimate waste generation rates should take into account seasonal as well as geographic variations.

The results of several waste generation surveys are shown in Exhibit 4-1. They range in time from 1973 to 1985. The data indicate a range of generation

EXHIBIT 4-1. RESIDENTIAL WASTE GENERATION RATES

Location/Year	lb/person/day	Comments
Santa Clara County, CA, 1977	3.3	
San Francisco, CA 1977	3.3	
Alameda County, CA 1977	2.3	
Contra Costa County, CA 1977	3.5	
City of Tulsa, OK, 1985	2.8	
Milwaukee, WI, 1978	1.1	Based on 3.0 person/household. Does not include yard waste.
Marin County, CA, 1980	1.3	Base on 3.0 person/household.
Tucson, AZ, 1973-1980	1.1	Based on 3.0 person/household.
North Santa Clara County, CA 1983	1.8	Northern portion of Santa Clara County.
Dorchester County, MD 1980	2.0	Rural county. Includes wastes identified as residential or institutional and hauled to municipal landfill.

SOURCES:

1. Survey of Solid waste Quantity and Composition in the San Francisco Bay Area, SCS Engineers, Long Beach, CA, 1978.
2. Municipal Solid Waste Generation in Tulsa, Oklahoma, SCS Engineers, Covington, KY, 1985.
3. The Milwaukee Garbage Project, Dr. William L. Rathje and Dr. Barry Thompson, published by The Solid waste Council of the Paper Industry, American Paper Institute, Washington, D.C, 1981.
4. Comprehensive Waste Characterization on a Quarterly Basis, J.C. Glaub and G.M. Savage, Cal Recovery Systems, Inc., Richmond, CA, undated.
5. Dorchester County, Maryland Solid Waste Management Plan, SCS Engineers, Reston, VA, 1980.

rates from 1.1 to 3.5 lbs per person per day. All proport to include only residential refuse. Thus, wastes from commercial establishments were not included in the calculation of the generation rates. Even the most closely controlled surveys can include assumptions or data that are erroneous. The source of refuse is sometimes uncertain since haulers sometimes collect both commercial and residential waste using the same truck. Likewise, population estimates or estimates of the number of persons per household are subject to error and even slight differences, particularly in the number of persons in the household. This can result in dramatic differences in calculated generation rates.

The National Solid Waste Management Association (NSWMA) reported average residential waste generation in its "Technical Bulletin 85-6, Basic Data: Solid Waste Amounts, Composition, and Management Systems". It estimates a solid waste generation rate of 2.5 to 3.5 lbs per person per day. The first five entries in Exhibit 4-1 generally support that range. The range of 2.5 to 3.5 lb per person per day appears to be accurate enough for large-scale planning purposes and general reports covering wide geographic areas. Exceptions definitely occur from place to place and throughout the year in any one location.

Composition

Residential waste composition data are scarce. Most reports of composition are based upon visual observations and intuition rather than the manual sorting and weighing of refuse and its components. Even weighing programs have their limitations and the results are difficult to extrapolate accurately.

Until the early 1970's, there was little interest in solid waste composition. Early waste composition waste studies were motivated by interest in recycling. Thus, the composition studies of the 1970's generally focused on identifying recyclable materials. These included various grades of paper, glass, usually aluminum and other metals separately, and sometimes wood and plastics. Other components were considered as "others".

In the the late 1970's interests shifted toward the recovery of energy from municipal waste through incineration. This caused a change in the approach to waste composition studies. These studies stressed both the size and general characteristics of the waste related to their energy recovery potential. In general, the solid wastes were categorized as combustibles, magnetics, non-ferrous metals, glass, and others. The presence of combustibles gave incinerator planners information on the energy content of the refuse. The presence of metals indicated what portions of the wastestream could be separated by magnetic means or what waste portions might cause problems with incinerator operations. Likewise, glass was seen as a problem material for incinerator operations and its presence was usually identified.

Thus, the limited information bank on residential waste characteristics is not consistent; nor are surveys easily comparable to one another. Exhibit 4-2 includes waste composition information from 10 locations. The studies were

EXHIBIT 4-2. RESIDENTIAL WASTE COMPOSITION*

	Newsprint	Corrugated	Ferrous Metal	Non-Ferrous Metal (mostly aluminum)	Glass	Plastic	Organics	Misc. Inorganics
Santa Clara County CA 1977[1]	12.2	3.1	4.8	1.0	7.7	5.9	67.3	N/A**
Santa Clara County, CA 1984[2]	13.0	14.9	3.4	0.9	7.7	6.6	51.7	1.8
San Francisco, CA 1977[1]	10.8	6.6	4.4	1.0	7.3	4.6	65.0	N/A
St. John's Landfill Portland, OR 1979[3]	10.3	3.9	7.1	N/A	N/A	N/A	71.8	6.9
Rossman's Landfill Portland, OR 1979[3]	8.1	5.1	6.6	N/A	N/A	N/A	73.9	6.3
St. Louis, MO 1981[4]	N/A	N/A	4.4	1.1	7.4	N/A	N/A	N/A
Los Angeles, CA 1981-82[5]	6.3	4.0	6.3	2.0	4.3	2.2	56.8	17.1
Dearborn, MI 1979[6]	8.1	N/A	3.1	0.3	3.3	5.4	73.0	6.8
San Diego County CA, 1981[7]	9.1	5.5	4.0	1.0	8.8	10.6	53.6	7.4
Burbank, CA 1980[8]	7.9	4.8	3.7	1.4	6.8	N/A	71.9	3.5

* Percent by weight
** Not Available

EXHIBIT 4-2 (continued)

Sources:

1. Survey of Solid Waste Quantity and Composition in the San Francisco Bay Area, SCS Engineers, Long Beach, CA, 1978.

2. Comprehensive Waste Characterization on a Quarterly Basis, J.C. Glaub and G.M. Savage, Cal Recovery Systems, Inc.

3. Solid Waste Characteristics and Flow in the Portland Metropolitan Service District, SCS Engineers, Long Beach, CA 1980.

4. Solid Waste Sampling Program St. Louis Resource Recovery Project, SCS Engineers, Long Beach, CA, 1982.

5. Unpublished Data, Bureau of Sanitation, City of Los Angeles, CA.

6. A Comprehensive Municipal Refuse Characterization Program, Proceedings of the 1980 National Waste Processing Conferences, American Society of Mechanical Engineers, May 1982.

7. An Applied Statistical Approach to Refuse Composition Sampling, A Comprehansive Municipal refuse Characterization Program, Proceedings of the 1980 National Waste Processing Conferences, American Society of Mechanical Engineers, May 1982.

8. Municipal Waste Characterization, Burbank California, SCS Engineers, Long Beach, CA 1980.

conducted over the timeframe 1977 through 1984. Although other data are available, some are prior to 1970 and most support the figures shown. The data seem to indicate fairly consistent composition from one location in the country to another and over the seven-year time span represented. The most consistent results include the following:

Material	Percent by Weight
Newsprint	8-12%
Corrugated	4-6%
Ferrous Metal	3-5%
Aluminum	1%
Glass	7-8%
Plastic	5-7%

The remainder primarily consists of other organic wastes. These include other types of paper products, wood, yard debris, food wastes, rubber, and leather which make up some 65 percent of the entire residential wastestream.

There has been a resurgence of interest in solid waste composition for purposes of overall solid waste management planning including resource recovery. SCS Engineers began an extensive solid waste composition study in Michigan in February 1986. Wastes delivered to six disposal sites are being manually sorted. The sites are located throughout the state and represent urban and rural areas. Composition surveys will be conducted four times in 12 months in order to account for seasonal variations.

HOUSEHOLD HAZARDOUS WASTES

Only three attempts at quantifying amounts of hazardous wastes coming from households have been identified. Each has used a different approach and, not surprisingly, the results of each are different from one another. The small number of projects focusing on quantities of HHW reflects the relatively recent nature of interest in this topic and the relatively large amount of effort required to conduct a waste composition program.

The Los Angeles County Sanitation Districts conducted a limited characterization study in 1979 (1). The purpose of the study was to estimate the types and quantities of industrial-type wastes including both hazardous and non-hazardous materials received at landfills and one transfer station in Southern California. The first step in the effort was to identify these wastes. The Districts developed the list of items of interest as shown in Section 3. Manual sorting and characterization of 155 tons of refuse were included in the program. This program involved both a count of the number of containers associated with HHW and measurement of the quantity of their contents. More than 90 percent of the containers were considered empty.

The presence of hazardous wastes from all sources was found to be quite low. The Districts estimated that notably less than 1 percent of all refuse received at these facilities was hazardous. The majority of these wastes came from commercial/industrial-type sources. It was estimated that less than 20 percent of all hazardous waste entering the sites came from residential sources.

In a more recent effort, the Los Angeles County Sanitation Districts have been systematically sorting loads of refuse to identify hazardous waste. Since California has a zero small quantity generator exemption, all commercial sources of hazardous waste are legally required to dispose of those wastes in permitted hazardous waste facilities. Thus, the thrust of the program is to identify commercial violators. In 1984 and 1985, 5 to 6 refuse trucks per day were inspected for hazardous wastes. The programs were conducted at four Los Angeles County landfills and one transfer station. The inspectors were primarily interested in identifying commercial-size quantities of hazardous wastes and, therefore, typically looked for containers larger than one gallon in size or for entire boxes full of hazardous wastes. Nearly 3,500 loads of refuse representing some 15,000 tons of waste were searched in 1984. Results indicated total hazardous waste to represent only 0.00147 percent of the total amount of waste delivered to these facilities.(2) Expressed in another way, total hazardous waste was about 15 parts per million in the entire mixed municipal waste stream including commercial as well as residential sources.

The Sanitation Districts caution against a comparison of results between the 1979 and 1984 projects. In 1979, some 155 tons of refuse were sorted with hazardous waste estimated at much less than 1 percent. The 1984 sorting involved some 15,000 tons with hazardous waste estimated at 0.00147 percent. Hazardous waste disposed at these municipal sites had not necessarily decreased during this period. The data are too limited to draw any definite conclusions regarding the exact presence of household hazardous waste, generation rates, or trends in generation. A third approach in determining composition of household hazardous wastes is described subsequently as part of the discussion of the Albuquerque, NM residential hazardous waste survey.

Composition of Household Hazardous Wastes

Los Angeles County--

The 1979 project conducted in Los Angeles County involved waste characterization to identify commercial and industrial-type wastes that might be hazardous. The following are general results from that survey:(1)

• Household and cleaning products	40.0 percent
• Automotive products (includes oil and antifreeze)	30.1 percent
• Personal items	16.4 percent
• Paint and allied products	7.5 percent

• Insecticides, pesticides and herbicides	2.5 percent
• Other	3.5 percent

University of Arizona--

The Department of Anthropology at the University of Arizona in Tucson has conducted detailed residential refuse characterization from 1973 through the present. During the two most recent years, efforts were focused on identifying HHW. The types of items identified as hazardous were listed in Section 3. The primary thrust of the characterization studies have been to count the number of containers that could have or do contain hazardous waste. Future work will involve determining the amounts of residue typically found in these containers. One of the interesting results of this project is the estimate of the large number of such containers discarded by each household every year. The project was conducted in both Tucson, AZ and Marin County, CA near San Francisco. The comparative results are as follows:(3)

	Tucson, AZ	Marin County, CA
Number of individual pickups characterized	1,345	144
Hazardous waste items	1,195	160
Tons of refuse not including yard waste	13.1	2.1
Hazardous waste items per ton	91	76

The University of Arizona indicates that about 100 hazardous items (containers) are discarded per household each year. Thus, the some 120,000 households in Tucson generate approximately 11 million of these hazardous items annually.(3) Again, essentially no research has been done to quantify the contents of these containers; just to count them. The researchers caution that their samples have been small and that extrapolating the data is crude, at best. The actual degree of hazard represented by these materials and the quantity of the materials going into the municipal landfills are quite uncertain. As these hazardous materials continue to accumulate in landfills the issue of a safety threshold becomes an increasingly vital public concern. A better estimate of the potential environmental damage awaits a more thorough determination of the presence of household hazardous waste as well as the types and characteristics of these wastes.

City of Albuquerque, NM --

Albuquerque depends entirely upon ground water for its muncipal water supply. After one of its wells became contaminated, the City undertook industrial and residential hazardous waste surveys attempting to identify the source of contamination. The residential survey took an entirely different approach from that used in Los Angeles or by the Univeristy of Arizona.

In January 1983, a house-to-house survey was conducted to obtain information on waste generation habits.(4) The City's Environmental Health and Energy Department identified 386 households to be included in the survey. These households were divided amoung the four quandrants of the city in proportion to population. Three basic questions were asked:

- What are household hazardous wastes?
- How hazardous are certain wastes?
- How much of each of these wastes did you dispose last year, and how were they disposed?

The first question was asked in a completely unassisted manner. The interviewer asked the householder to identify as many of general types of household hazardous wastes as they could. Twelve percent of the respondents could not name any household hazardous wastes and an additional 28 percent could only name one. Thus, without prompting, 40 percent of the householders could not name more than one hazardous household waste. The most commonly identified item was the group of household cleaners with over 60 percent of the respondents identifying that type.(4)

The next question requested the householder to rate the degree of hazard associated with selected items. Twelve household items frequently considered hazardous were included in the list. Additionally, shampoo, sawdust and mouthwash were included as "ringers". The respondents were asked to give their opinion of an item's hazardous nature by responding in terms of a five point scale, ranging from not hazardous to extremely hazardous. The results of the survey are shown in Exhibit 4-3.

Interestingly, 3 percent of the respondents considered pesticides and poisions not hazardous and 25 percent did not think motor oil was hazardous. On the other end of the scale, 1 percent of the surveyed population thought that mouthwash was extremely hazardous and 2 percent thought that both shampoo and sawdust were extremely hazardous. The results indicate a wide range of opinions as to what types of household items are and are not considered hazardous.

The next step in the survey was an attempt to quantify the amounts of 12 hazardous items generated and disposed of by homeowners in Albuquerque. The interviewer asked each person to estimate the quantity of each of 12 items that they disposed during the past 12 months. Additionally respondents were questioned about their method of disposal (e.g., putting the item out for city refuse collection, pouring the substance down the sewer, hauling it to the landfill, or using other land disposal methods). The results indicated that the vast majority of HHW disposed in Albuquerque was automotive related. Waste motor oil and antifreeze combined amounted to approximately 75 percent of the total.(4) This is in contrast to household cleaners and polishes that amounted to only about 2 percent of the total.

EXHIBIT 4-3

ALBUQUERQUE, NM RESIDENTS' PERCEPTIONS OF THE HAZARDS ASSOCIATED WITH SELECTED TOXIC SUBSTANCES

	Degree of Hazard				
Substance	1 Not Hazardous	2 Slightly Hazardous	3 Hazardous	4 Very Hazardous	5 Extremely Hazardous
Pesticides	3%	4%	12%	21%	60%
Poisons	3%	1%	7%	15%	74%
Household Cleaners	12%	20%	31%	22%	16%
Household Polishes	25%	30%	27%	10%	9%
Drain Openers	2%	4%	10%	16%	68%
Motor Oil	25%	20%	33%	12%	10%
Antifreeze	11%	10%	24%	30%	25%
Paints	11%	15%	22%	18%	33%
Weed Killers	4%	7%	13%	20%	56%
Fertilizers	18%	21%	28%	15%	16%
Glues	26%	22%	16%	14%	22%
Shampoos	61%	20%	13%	4%	2%
Sawdust	68%	19%	7%	3%	2%
Mouthwashes	80%	14%	5%	1%	1%
Solvents or Thinners	5%	11%	14%	23%	46%

Source: Reference 4

The Albuquerque survey included an estimate of HHW quantities generated each year. Survey results, extrapolated a city population of 96,300 dwelling units, yield an estimated 1.6 million pounds (800 tons) of HHW annually.(4) Assuming 3.0 persons per dwelling unit and daily overall residential waste generation rates of 2.5 to 3.5 lb per person, the presence of HHW in Albuquerque residential waste was approximately 0.5 percent.

The reader is cautioned not to interpret these results as indicative of nationwide trends or to make other projections based on the results of the Los Angeles or Albuquerque data. While the Los Angeles programs involved weighing, they focused on commercial-size containers and, therefore, may have underestimated the proportion of total household waste that is HHW. The Albuquerque survey was based entirely on residents' responses and memories. Neither could be called statistically accurate for numerous reasons. The results should only be used to estimate, in the most general way, the types and amounts of HHW. The lack of more substantial documentation of HHW generation is definitely a data gap.

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2. Unnannounced Search Summary 1984, Los Angeles County Sanitation Districts, Solid Waste Management Department, Whittier, CA 1984.

3. Preliminary Results from Household Phase Research, Department of Anthropology, University of Arizona, Tucson, AZ, 1985.

4. Residential Hazardous/Toxic Waste Survey, Environmental Health and Energy Department, City of Albuquerque, NM, 1983.

SECTION 5
IMPACTS ON SOLID WASTE MANAGEMENT AND THE ENVIRONMENT

STORAGE AND COLLECTION

Impacts on the Public

The presence of HHW in the residential wastestream certainly has some impact on not only the householder but also on refuse collection and disposal personnel. In the vast majority of instances, disposal of hazardous waste from homes likely does not harm anyone directly. However, there have been instances across the country in which people have been injured by HHW.

Homeowners are probably the group most often affected. When hazardous household products are misused or improperly stored or disposed, residents are the ones most likely exposed to the dangers, and they will be subject to the longest term exposure. Children and pets are also often present and they may be particularly susceptable to the hazards posed by some household products.

The nature of some HHW also increases their potential damage to homeowners over a period of time. Materials that are used infrequently are often stored in closets, basements, or garages for long periods of time. Materials such as paint thinners, solvents, fertilizers, and others may react with their containers over the years, causing the containers to deteriorate. This further increases the potential danger to homeowners.

There are no known studies or tabulations of injuries or illnesses to homeowners related to HHW. However, burns from acids, respiratory problems from volatile solvents, and other health impacts have certainly been caused or aggravated by HHW. These incidents are not specifically reported as being associated with the storage or disposal of hazardous waste but are lumped together in general categories such as household accidents.

The special collection programs for household hazardous waste are certainly directed in part at reducing the potential hazard to homeowners. Educational aspects of the programs help the public identify HHW, provide guidance related to the safe use of these materials, identify substitutes that are less hazardous, and describe safe disposal methods. The collection aspects of these programs result in removing pesticides, solvents, and other materials that may be stored improperly over long periods of time. This definitely reduces the chance of illness or injury. Of course, the actions associated with the collection programs, i.e., homeowners collecting the materials and transporting them to the collection location, certainly increase the potential for exposure. However, this is for a relatively short period of time.

Refuse Collection

Refuse collection personnel are also affected by household hazardous waste. Little has been done in the way of documenting injuries to refuse collectors associated with the handling of these materials; however, some cities and organizations are aware of the potential and are trying to protect sanitation workers. The Governmental Refuse Collection and Disposal Association (GRCDA) has conducted a series of workshops across the country to alert public waste management personnel to the presence of hazardous waste and the related dangers. These workshops focus on both the presence of hazardous waste from small commercial and industrial sources as well as from residential sources. Tips have been provided as to how refuse collectors can identify suspected hazardous waste and what to do when some of these material are found.

Public and private refuse haulers usually provide some form of safety training to their employees. Usually this is associated with safety around the collection vehicle and potential injuries associated with routine collection activities. However, some cities are providing training associated with hazardous waste.

The City of Tempe, Arizona has implemented an extensive program related to household hazardous wastes.(1) The program involves the Public Works Department and the Fire Department. Public education, as well as planning for hazardous waste incidents are elements of the program. The City is providing education to its citizens to increase their awareness of what are hazardous wastes and what to do with them. Announcements on cable television, the radio, and in newspapers list commmon types of HHW. Suggestions are provided regarding what not to do with them, e.g., mixing of certain materials or dumping them down the sewer.

Additionally, Tempe provides a special pick-up service for HHW. Homeowners who think they might have some hazardous wastes may call for the pick-up service. In response to a call, a refuse supervisor and a fire inspector visit the home to identify the material. If it is hazardous, it is removed, stored, and eventually disposed via a hazardous waste contractor.

Training is also provided to City refuse collectors and street personnel regarding hazardous wastes. This is conducted in conjunction with the fire department and focuses on hazardous spills as well as HHW. Collectors are trained to detect potential hazards and to respond appropriately. When a suspicious item is identified, refuse collectors radio the dispatcher who then informs the refuse and fire inspectors. The inspectors identify the material and, if it is determined to be hazardous, they isolate it from residents and buildings as much as possible. If the waste is in one of the residential automated collection containers, the entire container (up to 300 gal.) is placed into a special overpacked drum the City has available for such situations.

The training is thorough and, periodically, all personnel go through refresher training. All new personnel receive the HHW training. Monthly and quarterly safety meetings are used to update all personnel. To further reinforce the training, the City periodically conducts simulated hazardous waste incidents. Responses of personnel are evaluated and improved techniques are developed and implemented. City personnel know of no other similar training program in the country.

The training and response programs were developed to minimize the impact of improper storage and disposal of both household and commercial hazardous wastes. Tempe personnel were concerned that the reduction of the small quantity generator exclusion to 100 kg. per month would encourage owners of small businesses to illegally dispose of their hazardous wastes in residential containers. This may occur in Tempe where residential collection is fully automated using 90 and 300 gallon containers.

Refuse collectors have been injured by HHW. The number and severity of accidents, injuries, or health impacts associated strictly with HHW are difficult to identify. The information is often vague and is not centrally-located.(2) In most instances, injuries related to HHW have to be inferred. However, the Association of Bay Area Governments in California performed a study on inappropriate disposal of hazardous wastes from small quantity generators and noted cases of injuries from inappropriate disposal of HHW.(2) Most of the injuries occurred while the waste was being emptied or compacted. Some of the incidents that have affected refuse collectors include:

- Serious injury to one refuse collector has been directly related to HHW. A refuse worker in San Diego, CA lost his sight when hazardous waste from a residence spilled on his face. The hauling firm notified the residents of the injury and identified wastes that should not be discarded in residential waste. The San Diego Environmental Health Department was barraged with phone inquiries on how to dispose of HHW. A task force was formed that subsequently developed the current City program.(3)

- A private firm in Lemon Grove, CA reported a number of incidents in which swimming pool chemicals splashed on collection personnel during the compaction of residential refuse. One worker lost 50 percent of the use of his left eye.(2)

- Used motor oil caused severe eye irritation of three disposal personnel in Lemon Grove, CA. (2)

- Severe eye irritation in one incident was caused by contact with paint thinner also in Lemon Grove, CA.(2)

- Some 42 incidents have been reported in Los Angeles County, CA related to HHW. Injuries to refuse collectors have been caused primarily by oil, battery acids, swimming pool chemicals, paints, and solvents.(4)

- A refuse collector in Sacramento County, CA lost his sight when splashed by swimming pool acid during compaction.(4)

- At least three injuries per month occur in San Francisco, CA, caused by exploding aerosol cans.(4)

- A caustic material in residential refuse caused severe skin irritation to a refuse collector in Roscoe, IL.(2)

- A sealed container of ammonia burst under compaction and sprayed a refuse collector's eyes and face in Boyne City, MI.(2)

HAULING AND DISPOSAL

Household hazardous wastes can also have negative impacts on the hauling and disposal of refuse. A number of these wastes, particularly automotive products, are ignitable. Therefore, it is certainly possible that some of them have caused fires in refuse collection trucks. Fires in packer trucks are not unusual. Personnel from the City of Tempe, Arizona report an average of five such fires in the City's residential packers each year.(1) They believe there are only two likely causes: hot ashes from barbecues or fireplaces, or chemicals (HHW). Investigations have not identified the numbers of fires attributable to each type of waste. However, if only one packer fire per year in the city of 170,000 is caused by HHW and this number is extrapolated to the entire country, HHW are a significant source of property loss and potential injury or health impacts.

Personnel at a transfer station, landfill, or other disposal site may also be injured by HHW. The activities of unloading, spreading, and compacting refuse often cause containers to rupture and contents to be sprayed into the air. Injuries and accidents at the disposal site have been reported for both haulers and landfill personnel. Again, little tabulated information is available. However, reports from disposal site supervisory personnel indicated that incidents related to hazardous wastes occur, but rather infrequently. This relatively low level of reported incidents may be due to the perceived minor nature of these events when they occur. Only accidents that require special care such as the use of a respirator or something more than simple first aid are likely to receive recognition as being related to HHW. Furthermore, a landfill is a relatively accident-prone area and numerous cuts and burns occur that are not related to hazardous waste.

The unusual or dramatic events related to hazardous waste are often remembered. Some landfill personnel report gas cylinders in refuse that rupture when the dozer runs over them, blowing off the end of the cylinder and propelling it several yards. Other incidents are often associated with people hauling their own wastes and unloading the vehicles by hand. Other types of concerns includes inhalation of dust and vapors from HHW.

Some specific incidents involving disposal personnel have been associated with HHW. Many are fires in packer trucks or at landfills. Although it is difficult to prove the relationship between these events and HHW, intuitively there is a connection.

- In Ashland, MA, a load caught fire while being unloaded at the landfill. (2)
- In Evansville, IN, a load caused a fire that took four hours to extinguish.(2)

- A collection vehicle caught fire and was destroyed in Michigan from flammable waste in the load.(2)

- A resource recovery facility was severely damaged by a fire from a small container of flammable material in Wisconsin.(2) Explosions at refuse shredders are often blamed on solvents in the residential waste.

- Three persons were hospitalized with rashes and respiratory problems at a transfer station in Lexington, KY.(2)

- In Downers Grove, IL, chlorine tablets caused a fire in a truck.(4)

It is impossible to designate HHW as the sole cause of the injuries to refuse collectors, landfill operators, or to collection and landfill equipment. Factors such as the wide range of waste collected and the lack of detail in the reported incidents preclude any definitive conclusions. While the presence of household hazardous waste has no reportable or measured association with worker safety, certainly it has an impact. Any steps to reduce the amount of these materials being handled by haulers or disposal personnel will reduce these hazards to them.

ENVIRONMENTAL IMPACTS

Does household hazardous waste have any impact on the environment? During the conduct of this project, no documented cases were identified of environmental impacts caused solely by HHW. However, this does not mean that HHW do not impact the environment. There appears to be no nationwide reporting procedure that includes information relating HHW to the environment. Thus, only a scattering of individual reports were obtained.

HHW have been detected in surface water and in sewage in Seattle, WA.(5) A study of urban streams in Seattle indicated that residents were disposing of pesticides improperly such that they were migrating into the surface water. Concurrently, analysis of wastewater indicated that some contaminants were from homeowners disposing of HHW via the sanitary sewer system. Although no environmental impacts were discovered, these incidents certainly verify the presence of HHW in the environment and point to potential damage to ecosystems. These studies led to implementation of the HHW collection program in the Seattle area.(6)

Indirect evidence indicates that HHW may contribute to ground-water contamination. More than 12 former municipal waste disposal sites are on the National Priorities (Superfund) List of sites with contamination requiring near-term corrective action. In the past, these sites received HHW and commercial/industrial wastes (likely including hazardous wastes) in addition to household refuse. The present ground-water contamination indicates that industrial (or HHW) chemicals are the source of the problem. However no direct proof exists that HHW are the only pollutants. This same situation is likely present at many active municipal solid waste landfills.

The limited data from Los Angeles County and Albuquerque noted in Section 4, indicate that HHW makes up much less than 1 percent of the residential wastestream and it may be as little as 15 parts per million. Thus, these materials are relatively rare and their impact on the environment may be somewhat insulated by the presence of non-hazardous refuse. The landfill environment may reduce the hazard of these materials. The actions of disposal likely cause dispersion and at least brief exposure to the atmosphere. This likely leads to evaporation of some liquids and the dispersion of the wastes throughout a greater volume than in the closed container. Both situations could lead to accelerated chemical or biological activity reducing the hazardous nature of some of the materials.

Some hazardous constituents will persist in the environment for long periods of time. They are candidates for migration into the air, ground water, and surface water. Good management of a sanitary landfill will minimize the impact of HHW on the environment. However, there certainly is some potential for negative impact. Constituents from hazardous wastes can be leached as water percolates through the refuse. Some HHW are volatile. The constituents may become a part of the landfill gas being generated through decomposition of organic materials. The gas may migrate and pose a health threat if found in high enough concentrations. Another possibility is contamination of the ground water through contact with landfill gas contaminated from household hazardous waste.

In summary, there appears to be impacts on human health and the environment from household hazardous waste. These impacts begin with the homeowner and extend to the refuse collection and disposal activities. In addition, after disposal in a landfill environment, HHW can contribute to contamination of air, subsurface gas, ground water, and surface water. The number and severity of accidents, injuries, or health impacts has not been identified or tabulated. Intuitively, the overall impact of HHW is probably not great. The amount of hazardous wastes in the residential waste stream is probably small; however, even that is uncertain at this point. Only a few household products are considered hazardous wastes as defined in Section 3 and listed in Exhibit 3-1; granted, the list is not exhaustive. The majority of suspected household hazardous wastes are not pure substances; thus, their degree of hazard is less and probably much less than the same quantity of the pure hazardous constituent, i.e., those constituents in industrial wastes destined for management at a RCRA Subtitle C facility. A better estimate of the potential environmental damage awaits a more thorough determination of the presence of hazardous waste in the residential waste stream as well as the types and characteristics of these wastes. Similarly documentation of any environmental impacts that can be tied to HHW could shed light on this question.

Possibly the greatest impact is on those in contact with these wastes. This ranges from the homeowner to disposal site personnel. By definition, these materials are wastes, and therefore may not be handled with extreme care. Likewise their nature and the ways in which they are used and stored lead to exposure and potential injury. Thus, any program designed to reduce the amount of HHW from generator to disposal and to reduce the amount being stored by homeowners should be beneficial to all concerned.

REFERENCES

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2. Association of Bay Area Governments, "Evidence of Inappropriate Disposal of Hazardous Waste From Small Quantity Generators", Technical Memo No. 11 from L. Jackson Russel and N. Knappenberger, April 1984, p.11.

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6. White Hat Hazwaste Programs Target Homeowners, Small Shops, Waste Age, May 1984, pp 83-84.

SECTION 6
SPECIAL COLLECTION PROGRAMS

GOALS AND TYPES

Programs to collect household hazardous waste are operated at the local and state level. Both local and state-wide HHW programs generally have five goals:

- Increase general public awareness of the hazardous materials found in most homes and how these materials may impact on human health and the environment;
- Educate residents as to the best methods of HHW disposal;
- Remove HHW from homes, thus reducing exposure and potential injury;
- Reduce danger to refuse collectors and other sanitation workers; and
- Provide proper disposal for HHW.

State-level programs are discussed in the next section of this report. The remainder of this section focuses on locally-sponsored and operated HHW collection programs.

LOCAL PROGRAMS

Public Education

Public education is an important aspect of every local HHW collection program. It focuses on several aspects to:

- Make the public aware of the presence of hazardous materials in the home and consequences of improper use and disposal;
- Identify substitutes that are less hazardous;
- Encourage better home management practices such as buying only the amount of hazardous material that is needed at any one time;
- Identify proper storage and disposal methods; and
- Promote participation in HHW collection and recycling programs.

The impacts of the educational aspects of collection programs are difficult to assess. Thus, they may be overlooked. Only the participation in the collection program gives a quantitative indication of the effectiveness of public education efforts. Certainly, public health and safety benefits are derived from these programs; however, no existing method to identify or evaluate the improvement was noted during this project.

Public education takes many forms. The appended case studies of collection programs include discussions and examples of publicity and educational materials. Some of the techniques that have been effective include:

- Posters, handouts, and special lesson units in schools;
- Public service announcements on radio, TV, and cable TV;
- Inserts in utility bills;
- Meetings with civic organizations;
- Videotape and audio-slide presentations; and
- Endorsements and proclamations by local officials.

Collection program participation appears to be directly proportional to the amount of publicity and educational material used. The Albuquerque program began with an extensive public education effort 6 months prior to actual collection. Numerous approaches were used including many meetings with citizens' groups. Albqueraue had very good participation, as noted in the appended case study. In contrast, the Fairfax County, Virginia collection program was conducted only 6 weeks after official approval. Public education was limited, and participation was low. Details are in the appended case study.

No attempt has been made to assess the impact of public education related to HHW on the residents of Albuquerque or Fairfax County. However, it is intuitive that Albuquerque citizens are generally better informed about HHW than citizens of Fairfax County, and that the latter group know more about HHW than residents of an area where a collection program has never been conducted.

Types of Collection Programs

Over the past three years more than 100 locally-sponsored household hazardous waste collection programs have been conducted. In size, these have ranged from a town or city to an entire county. Most of the local programs use the collection site approach. In this approach, participants are asked to haul their HHW to the collection site for centralized identification, packaging, and shipment to a permitted hazardous waste facility. A few local programs have provided service at the residents' homes. These have included community-wide programs in which all residents could request curbside or backdoor collection service and those programs that limited this level of service to the elderly or handicapped as adjuncts to community collection site efforts.

Collection Sites

The collection site service is the most popular approach to HHW collection. Basically, this involves selecting one or more collection sites, setting a date, making the public aware of the service, and then conducting the program. The collection site approach requires the participating homeowners to identify the HHW, haul the wastes to the collection site, and then (sometimes) unload the materials as directed. This is nearly identical to the operation of a recycling center with participants hauling recyclables to a central location.

There are several variations on numbers of sites and lengths of programs. The most common is one site for one period of time (not repeated in the near future). The time period ranges from 1 to 5 days. Examples of the single location approach include many of the Massachusetts programs, Palo Alto, CA, and Albuquerque, NM.(1) This approach is most applicable to small communities and is less expensive than others.

Another variation involves using multiple sites either simultaneously or in sequence. Two or more collection sites are constructed and operated. They could be operated concurrently as was done in Fairfax, County, VA.(2) They could be operated at different times from one another. In Sacramento, CA, an urban collection site was operated on one Saturday and a suburban site on the next.(3) Multiple sites are advantageous to large areas and may encourage participation. Multiple sites are expensive, especially if operated simultaneously, because multiple, trained crews must be employed.

Collection site programs are usually operated once. Some have been repeated. The City of Palo Alto, CA, is researching the implementation of a permanent collection site at a recycling service center located near a municipal landfill. However, it would not be operated on a year-round basis, due to the prohibitive cost.(3) San Bernardino County, CA, started a 12-month pilot collection program in November of 1984. It involves continuous operation of collection sites at two fire stations. If the program is judged successful and desirable, it may be expanded to 10 or more fire stations and become a permanent county function.(4)(5)

Door-to-Door Collection

Some communities have opted to use a door-to-door or curbside pick-up approach. One community (Gresham, OR) attempted a one-day, curbside collection of HHW from all residents. The approach was similar to curbside collection of refuse or recyclables. However, the program was poorly publicized and participation was minimal.(6)

San Diego, CA, is an example of a scheduled, on-demand collection program. The City scheduled collection of HHW for specific days in different areas. Householders were to telephone if they desired service and a specific appointment was made.(7)

There are no known examples of continuous, on-demand programs in which a resident may telephone at any time to schedule collection of HHW. However, the Albuquerque, NM, program provided on-demand collection in conjunction with the collection site operations. The phone-in service was restricted to residents with transportation problems, the elderly, or the disabled.(8) Several other collection site programs have provided this service, but only as part of a collection site operation.

Advice

Some communities provide advice to residents concerning proper disposal methods for HHW. Usually, this guidance is offered in the form of a telephone service that advises residents as to whether or not a particular waste is hazardous. In addition, the service provides instruction regarding proper disposal methods, and informs residents if any collection program is planned or is in operation. For example, a telephone referral service is provided in Cuyahoga County, Ohio (Cleveland area). Citizens use a publicized hotline number to call the County Council on Hazardous Materials for instructions concerning the proper disposal of HHW. If the waste in question is hazardous, the citizen is told to take it to a commercial hazardous waste management firm contracted by the Council to accept HHW. The program will operate through September 1986 on grant funds from the U.S. Environmental Protection Agency. If local resources are available, it will be extended.(9)

Sponsorship

Organizations within the local government often sponsor the collection programs. These include departments or agencies related to environmental protection, health, sanitation, or energy. The funds for these programs usually come from allocations of general funds and monetary and service donations from the community.

In addition, public interest groups sponsor some collection programs. The most active single organization across the country is the League of Women Voters. The League frequently acts as a community catalyst for the initiation of collection programs. It has helped organize collection programs in over 80 towns in Massachusetts alone and numerous other localities across the nation. Funds for programs sponsored by public interest groups come from the groups themselves and are often supplemented with donations from individuals or other service organizations. Quite often, services are donated such as the use of a collection site, the use of equipment, or the availability of chemical expertise to identify wastes. Similarly, local governments will often make allocations of funds to these programs.

Private firms also sponsor local collection efforts. Sponsors have most frequently included commercial hazardous waste management firms and chemical manufacturers. Programs sponsored by these organizations are usually developed to promote the public image of the sponsor, in addition to collection of the hazardous waste. Funds are sometimes strictly those of the sponsoring company, but may also include donations of services and monetary contributions from public service groups or even governments, public interest groups, and private organizations.

Brief History

It is hard to pinpoint the actual "first" household hazardous waste collection program. Many programs seem to have begun simultaneously. The first exclusively household hazardous waste collection day resulted from the efforts of the League of Women Voters in Lexington, MA. It took place on October 30, 1982. A total of 93 households participated in the collection day, and 770 gallons of HHW were collected at a cost of $1,600. Since then, an increasing number of communities in Massachusetts have held collection days. In 1983, 14 communities collected nearly 20,000 gallons of HHW. The total cost for these collection days was about $37,000. In 1984, 31 communities collected over 46,000 gallons of waste at an estimated cost of nearly $108,000.(10) In 1985, over 80 communities in the State have or will hold HHW collection days.(11) The State of Massachusetts Department of Environmental Management has announced a $400,000 grant to sponsor a state-wide program.

In Seattle, WA, a program was also begun in 1982 and was sponsored by the King County Health Department. This county-wide collection program allowed citizens to make an appointment to bring in pesticides and old wood preservatives. County sanitarians conducted the program and were responsible for receiving and manifesting the materials. This has since become an ongoing program.(6)

Another Seattle, WA, program was sponsored by Seattle-Metro in 1982. The results of a study revealed that a large percentage of the waste that was contaminating the water supply was of residential origin.(12)(13) This prompted Seattle-Metro to sponsor an educational program aimed at the public, governmental agencies, educational institutions, waste haulers, and environmental groups. Initially, participation in the collection program was poor, yielding 500 gallons of waste annually. Since the program began more aggressive publicity of the collection efforts, participation has increased. Over 3000 gallons of waste were collected in 1985.(14)

Probably the very first collection program that included HHW and commercial small quantity generator waste was a program conducted by the State of Alaska Department of Environmental Conservation in 1982. Wastes were collected from 41 small businesses and government agencies (small quantity generators) and 48 households in Fairbanks and Anchorage. The 7,000 pounds of waste collected in the 12-day program was transported to Oregon and disposed in a hazardous waste landfill.(6)

As early as 1981, the Marion County Health Department in Lebanon, KY, sponsored a program to collect pesticides from residents, small businesses, schools, and agricultural firms during a 5-day program. The total quantity collected amounted to 1,400 lbs of solid chemicals and 500 lbs of liquids at a total cost of $1,200. Funding for this project was provided by local government sources.(12) Other states and communities have followed, designing programs to their specific needs; (e.g, the State of Virginia sponsored a program in 1983 to collect hazardous waste from community colleges, senior and junior high schools).(15)

The State of Oregon Department of Environmental Quality (in conjunction with the local fire department) sponsored a unique door-to-door program in Gresham, OR, in 1983. Department of Environmental Quality personnel and firefighters visited each home on a pre-designated day. Because the community was not notified as to the time of day the collection would take place, the participation rate was very poor.(6) It was the first HHW collection program in which the wastes were collected from the residents at their homes.

Many household hazardous waste collection day programs have been sponsored by various organizations throughout California. Between 1982 and 1984, collection programs were conducted in several cities including Sacramento, Palo Alto, and Redland. All of these programs required residents to deliver the wastes to a collection center.(12)

Subsequent to these examples of early HHW collection efforts, similar programs have spread to many states and numerous communities. Appendix C lists collection programs. The list is not complete due to the rapidly changing number of programs and the lack of a central clearing house for data related to HHW.

The idea of household hazardous waste collection is not limited to the United States. Other countries such as Canada and Denmark which have permanent regional collection sites. West Germany, and Australia also have become involved and aware of the potential environmental contamination from household hazardous wastes.(11)

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SECTION 7
STATE PROGRAMS

Several states have become involved in household hazardous wastes. Up to 26 states may be in various stages of studying the issues related to HHW, drafting legislation or regulations, planning collection programs, providing grants to local communities, or establishing state-level collection efforts (1). At least four states are known to have active programs. These include Vermont, Connecticut, Florida, and Rhode Island. These state programs fall into two categories: grants to local collection efforts and state-operated collection programs. These states are among the earliest to become involved in the topic; their programs are some of the most mature, and are briefly described below. Activities in Washington and Minnesota are also included.

Each of these state programs includes elements of public education and publicity, either conducted at the state level or by the local sponsoring organizations. No information has been available as to the impact of these programs, other than the resultant participation in the collection efforts. However, it is intuitive that safety and environmental benefits resulted from these programs.

VERMONT

Vermont's interest in HHW started in its General Assembly. It directed the State's Agency for Environmental Conservation to study methods of collection and to prepare a report. During the study, the Agency identified a proposed HHW collection program in Hartford, VT and nearby Hanover, NH. The Agency decided to provide a grant to cover most of the program's costs.(2)

Several organizations became involved with the program. Each was responsible for various aspects of the effort. Participants included the following:(2)

- Town of Hartford, VT - supplied the collection site;
- Upper Valley and Lake Seneca Council - provided overall coordination including planning, subcontracting, co-sponsor participation, and any reports;
- New England Marine Contractors, Inc. - served as the hazardous waste disposal contractor;
- Upper Valley Hazardous Waste Committee - was involved in the publicity and conducting the survey of participants; and
- Vermont Department of Agriculture - provided technical assistance and personnel to inventory and assess pesticides.

The Agency for Environmental Conservation assessed the results of the Hartford program. Participation and cost data are presented in later sections of this report. The Agency is considering a grant for a program in another area. If that program is conducted and considered successful, Vermont will assess the feasibility of a permanent HHW collection program.

The outcome of the Hartford Collection Day represents the total efforts of the Vermont program to date. The grant from the Agency of Environmental Conservation was $4,300. No estimate is available for the value of the services provided by the Vermont Department of Agriculture and the other groups noted above. Participation and quantities recovered are listed below.

- Duration: one day
- Number of participants: 110
- Number of households in area: 16,000
- Participation rate (110/16,000 x 100): 0.7%
- Weight of waste collected: 3,000 lbs
- Amount of waste per participant: 27 lbs
- Costs: reported costs of $5,000
- Cost per pound of waste: $1.67 based on reported cost of $5,000

CONNECTICUT

Connecticut's program, operated by its Department of Environmental Protection, is very similar to Vermont's. It was developed in response to interest by several communities. Funds for the grant project were appropriated through the State of Connecticut legislature as a part of the Department of Environmental Conservation's annual budget. It provides grants to local communities that operate HHW collection projects. The state grants pay 50 percent of the collection and disposal costs. All other costs are borne by the community through public funds or donations. Communities must apply for the grants. To date, 50 towns will receive grant funds for the first collection programs to be held in the spring of 1986 (3).

Connecticut provides written guidelines pertaining to HHW collection days. However, it does not want to get involved with regulation of HHW. The expense, difficulty in enforcement, and lack of manpower are some of the reasons cited (3).

FLORIDA

Florida was the first state to fund and operate a HHW collection program. Given the name "Amnesty Days", the Florida program involves more than just HHW. It includes small businesses and institutions as well as residential sources. The former sources may use the collection program without getting involved with the legal requirements of manifests, etc.

The collection program was established by Florida's Water Quality Assurance Act of 1983. It directed the Department of Environmental Regulation to establish and conduct Amnesty Day programs throughout the State. Funds come from a Water Quality Assurance Trust Fund. Limitations on expenses include a 5 percent ceiling on administrative costs and the same limit on public education.

The remainder pays for the actual collection and disposal activities which are contracted.

Extensive publicity was used to inform Florida residents and businesses about the Amnesty Day Program. This included television announcements, radio public service announcements, pamphlets, films, newspaper ads, and electric and water bill inserts. Also many organizations such as the Florida League of Cities, State Association of County governments, Florida Fireman's Association, Gulf Power and other organizations enclosed Amnesty Day information in their newsletters. As the first state-level program, Amnesty Day not only received intense media coverage within Florida, but the program was also covered by prestigious publications such as the New York Times, The Wall Street Journal, and even the National Geographic.

Operations

Two mobile collection facilities are used in Florida. They consist of semi-trailers containing small laboratories and storage space for the wastes collected. A hazardous waste contractor provides the trailers and all other services directly related to the collections. The contractor also hauls the wastes to permitted disposal facilities.

The collection facilities are set up in two locations simultaneously. They may be in the same county if warranted by the population, or in two different counties. Each facility is operated from 1 to 6 days at each location, again depending on population and anticipated participation from businesses. The entire Amnesty Day program is based on a three-year cycle with the provision of at least one collection day per county during a three-year period. More details about the Florida program are included in the appended case study.

Results

Amnesty Days had completed three phases through June 1985. Summary results of the three phases are noted below (4)(5).

- Average weight of waste collected: 701,400 lbs = 351 tons
- Number of participants: 7,000 (includes businesses and institutions)
- Weight of waste per participant: 100 lbs.
- Area and population served: 28 counties with a 1980 population of 7,259,700 living in 2,787,800 households, representing 42 percent of Florida's counties and 74 percent of its population.
- Household participation rates assuming each "participant" represented a household: 7,000/2,787,800 = 0.25 percent
- Range of household participation rates: 0.10 to 1.8 percent

- Estimated cost: $2,200,000 (6)
- Cost per pound of waste: $3.14

RHODE ISLAND

Rhode Island's program is similar to the one in Florida.(7) It is called Household Toxic Cleanup Day and is sponsored by the Rhode Island Department of Environmental Management, (DEM) Air and Hazardous Materials Section. A contracted hazardous waste management firm operates one-day Cleanup Days at five locations in the State, and disposes of the collected wastes. This program, occurring annually over the past two years, includes participation by educational institutions and local government agencies, in addition to households. It is designed and operated by the DEM and is funded by a bond issue. The annual program will be repeated until the funds are exhausted. At that time, another bond referendum will be voted upon.

There is also an on-demand program in Rhode Island. Depending upon the situation, as deemed by the DEM, a caller will either be told to store his HHW until the next collection day or, in an emergency situation, DEM personnel will collect the HHW from the home and dispose of it. An emergency situation is declared when a resident moves out of state, or if the type of waste is considered too dangerous for household storage. Such dangerous materials include laboratory chemicals, explosives, and radioactive waste. (6)

Operations

The DEM completely funds, designs, and supervises the HHW collection days. Only the handling, packaging, transportation, and disposal of the HHW are performed by a hazardous waste contractor. The DEM identifies the program locations based on the number of requests from towns in the state. Collection sites are always located on state-owned property, usually at schools or equipment yards.

Personnel at all of the collection sites consist of DEM staff or the contracted disposal firm employees. Volunteers are not used. When a participant enters a site, a DEM employee obtains identification information about the participant and removes the waste from the vehicle. The waste is moved to the processing area where contractor personnel identify, sort, and package the materials.

The DEM accepts all HHW delivered to the site without a quantity limit. A unique aspect of the program is the method of sorting the wastes. Pharmaceuticals are given to a drug control agency; explosives and highly reactive wastes are given to the local fire marshall; fertilizer and nonhazardous pesticides are given to a local nursery for reuse; and waste oil is recycled by the State at maintenance garages. The State plans to continue this program format, and has no plans for a permanent transfer and storage facility.

Results

Results of the most recent collection day were available and are shown below.(7)

- Number of participants: 350 (includes schools and local government agencies)
- Amount of liquid waste collected: 4600 gal (est 34,500 lb)
- Amount of solid waste collected: 300 lbs
- Population served: 20,000
- Weight of waste per participant: 99 lbs.
- Expendables, disposal: $15,000 per day
- Cost per pound of waste: $0.43

Note that the above costs do not include administrative costs of the entire State program that should be allocated to this specific collection day, nor are publicity costs included.

WASHINGTON

One continuous HHW collection program is being conducted in the Seattle metropolitan area of Washington. (8) Six permanent storage and transfer stations are located throughout the area. Operations are on-demand. Residents telephone a local health department office and make arrangements to take the HHW to the nearest location. The resident is met at the site and the waste is accepted, identified, and stored. Periodically, a contracted hazardous waste hauler collects the wastes and transports them to a permitted disposal site. Currently, the services of both the hauler and the disposal site are donated to the program.

The Health Department assumes the role of generator. Its personnel fill out the manifest and the department is responsible for the wastes until they leave the collection site. Participation in the program has been reported as light. A total of only 4 to 5 hours is expended at all collection sites each week.(8)

In September 1985, a law was passed in Washington State that requires County governments to develop and operate programs to manage both HHW and hazardous wastes from small quantity generators. Regulations for these programs are now being developed. Additionally, the State is setting up a telephone hot-line to provide advice related to HHW.

MINNESOTA

The State of Minnesota is conducting a two-year study of HHW.(9) The study will be conducted in three phases and will assess the operations and effectiveness of local collection programs. In the first phase, the State provides funds for local HHW collection programs and may plan and operate some programs. At other locations State funds will be used by local governments or private firms to operate programs. In addition, publicity and public education portions of the State's HHW program are funded by a U.S. Environmental Protection Grant of $25,000 (under RCRA, Section 8001 FY 1985 grant). Minnesota will conduct programs in urban, rural, and suburban areas. Objectives of the two-year study are to:

- Identify the types of wastes brought to HHW collection days;
- Compare geographically the types and amounts of wastes, e.g.
    - Urban vs rural and
    - Geographic regions within the State;
- Identify the types of people who participate in HHW collection days; and
- Conduct before and after interviews to determine behavioral changes.

In the second phase, HHW collection programs will be repeated in selected locations. Participation rates and waste quantitities will be identified and compared to initial programs. Funding for repeated programs will be shared between the State and the local communities. Data collected during the first two phases will be analyzed in the third phase. Results of the study will be presented to the Minnesota Legislature and used as the basis for future decisions related to HHW collection programs.

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SECTION 8
MAJOR ISSUES

LIABILITY

Hazardous waste regulations and liability are the first and foremost issues of concern to any organization contemplating a household hazardous waste collection program. Homeowners and others generating household hazardous waste are not required to comply with the Federal RCRA regulations regarding manifesting and other activities associated with hazardous waste. However, State regulations may differ from Federal regulations and compliance with local restrictions is also a consideration for organizers of HHW collection programs.

From the Federal standpoint, RCRA does not address HHW collection programs, nor are any limits set above which HHW become regulated under its Subtitle C (hazardous waste) regulations. A memo interpreting RCRA and CERCLA liability associated with HHW collection programs is included in Appendix E.

There are two areas of concern for liability associated with HHW collection programs:

- General liability including
  - Collection program personnel;
  - The public participating in the program;
  - Property damage that might occur at the collection site; and
  - Damage, injuries, or other incidents that might occur while the waste is being transported from the collection site.
- CERCLA liability related to potential future impacts caused by the ultimate disposal site.

General Liability

Program sponsors usually want to minimize their liability. In the majority of instances, a hazardous waste management contractor is utilized to operate the collection site. Thus, the contractor takes on the liability associated with operating the collection site at least in terms of the personnel and site being under its control.

Some liability exposure usually remains with the program sponsor. This is often associated with liability for the actions of its employees or members and liability associated with the collection site if the site is owned by the sponsoring agency, e.g., the high school parking lot used in the Fairfax, VA program. These aspects of liability are usually protected by insurance carried by the sponsor.

For programs conducted by municipal or county governments, public liability insurance provides coverage or is extended by a special rider. Counties with programs covered by liability insurance include those in Marion County, KY and Bernallio County, NM as well as Fairfax County, VA. In a collection program in Sacramento, CA, the hazardous waste contractor added the collection program sponsors to its own liability insurance policy that insured the sponsors as well as the contractor against lawsuits. Insurance costs are a portion of the overall program costs and are included in contractors' bids. In some instances, the sponsoring agency does not have public liability insurance that could be expanded to include collection day activities.

Two states have become involved in the question of liability. In the program operated by the State of Florida, the State has considered itself liable only for its own employees. Thus, the hazardous waste contractor must carry public liability insurance for any damage that might occur at the collection sites or during transport of the wastes. In Massachusetts, the Department of Environmental Quality requires that any community planning to hold a HHW collection program obtain Department approval of the firm transporting the waste with the transporter being required to be liable for transportation accidents and spills. The transporters must carry insurance for bodily injury, property damage, and environmental restoration.

In general, collection program sponsors want to minimize their liability exposure. Usually this is done by hiring a waste contractor to which as much liability is transferred as is possible. This approach minimizes the number of organizations potentially involved with litigation and minimizes the direct liability of the sponsoring agency.

CERCLA Liability

An issue of concern for many communities planning HHW collection programs relates to long-term liability related to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). In general, if a waste disposal site (hazardous or non-hazardous) is identified as a significant source of pollution and listed as a Superfund site for clean-up, sources of the waste as well as the owner or operator of the site could be liable for clean-up costs. HHW collection program sponsors thus could be the target of related law suits including citizens' suits. Some communities have cancelled plans for collection programs because of this issue.(1)

Concern about the potential liability of HHW programs under both CERCLA and RCRA led to preparation of a memo from the EPA Office of Solid Waste's Waste Management and Economics Division. That memo and others on the same topic are included in Appendix E. The memo content relating to CERCLA liability is summarized briefly in the following paragraph.

Household wastes containing hazardous substances as delineated in CERCLA Sections 101(14) and 102(a) are considered hazardous under CERCLA and, therefore, are subject to CERCLA liability (Section 107). Similarly, HHW consisting of any of the substances listed in Table 302.4 of 40 CFR Part 302 definitely would be classified as a hazardous substance. Although the HHW quantities generated by collection programs are relatively small, as compared to wastes generated by SQGs and the larger commercial sources, any amount is subject to CERCLA liability. This poses a problem for collection programs in that the waste sources, e.g. the communities, could become liable if a landfill used for HHW disposal eventually becomes a CERCLA site. EPA is still evaluating its CERCLA enforcement policy regarding this issue (see Appendix E).

DEGREE OF REGULATION

Currently, there appears to be a very low degree of regulation from State and local governments regarding household hazardous waste collection programs. However, as the collection programs increase in number, their visibility increases. More States are developing interests in HHW than previously and it is likely that State legislation and local ordinances will increase. City and county governments often pass resolutions establishing public HHW collection programs or at least acknowledging those planned by public service groups or private organizations. This often does nothing more than identify the concept, and give sanction to the use of public facilities, equipment, and personnel during the program.

The State of Florida has passed laws specifically addressing the collection of household hazardous waste. This is done under the Amnesty Day Program legislation and is more fully described in the Florida case study in Appendix D. The Florida law requires that a State agency provide collection service to each county in the State within a three-year period. This law is the basis for the appropriation of funds and the establishment of staff positions to manage this program. Other States may have laws or regulations, including those directed at hazardous wastes, that indirectly regulate HHW.

REFERENCE

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APPENDIX A

40 CFR PARTS 261.33 (e) AND (f)

§ 261.33 Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof.

The following materials or items are hazardous wastes when they are discarded or intended to be discarded as described in § 261.2(a)(2)(i), when they are burned for purposes of energy recovery in lieu of their original intended use, when they are used to produce fuels in lieu of their original intended use, when they are applied to the land in lieu of their original intended use, or when they are contained in products that are applied to the land in lieu of their original intended use.

(a) Any commercial chemical product, or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section.

* * * * *

(e) The commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products or manufacturing chemical intermediates referred to in paragraphs (a) through (d) of this section, are identified as acute hazardous wastes (H) and are subject to be the small quantity exclusion defined in § 261.5(e).

[*Comment:* For the convenience of the regulated community the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous waste No	Substance
P023	Acetaldehyde, chloro-
P002	Acetamide, N-(aminothioxomethyl)-
P057	Acetamide, 2-fluoro-
P058	Acetic acid, fluoro-, sodium salt
P066	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester
P001	3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts, when present at concentrations greater than 0.3%
P002	1-Acetyl-2-thiourea
P003	Acrolein
P070	Aldicarb
P004	Aldrin
P005	Allyl alcohol
P006	Aluminum phosphide
P007	5-(Aminomethyl)-3-isoxazolol
P008	4-Aminopyridine
P009	Ammonium picrate (R)
P119	Ammonium vanadate
P010	Arsenic acid
P012	Arsenic (III) oxide
P011	Arsenic (V) oxide
P011	Arsenic pentoxide
P012	Arsenic trioxide
P038	Arsine, diethyl
P054	Aziridine
P013	Barium cyanide
P024	Benzenamine, 4-chloro-
P077	Benzenamine, 4-nitro-
P028	Benzene, (chloromethyl)-
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-
P014	Benzenethiol
P028	Benzyl chloride
P015	Beryllium dust
P016	Bis(chloromethyl) ether
P017	Bromoacetone
P018	Brucine
P021	Calcium cyanide
P123	Camphene, octachloro-
P103	Carbamimidoselenoic acid
P022	Carbon bisulfide
P022	Carbon disulfide
P095	Carbonyl chloride
P033	Chlorine cyanide
P023	Chloroacetaldehyde
P024	p-Chloroaniline
P026	1-(o-Chlorophenyl)thiourea
P027	3-Chloropropionitrile
P029	Copper cyanides

Hazardous waste No	Substance
P030	Cyanides (soluble cyanide salts), not elsewhere specified
P031	Cyanogen
P033	Cyanogen chloride
P036	Dichlorophenylarsine
P037	Dieldrin
P038	Diethylarsine
P039	O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate
P041	Diethyl-p-nitrophenyl phosphate
P040	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	Diisopropyl fluorophosphate
P044	Dimethoate
P045	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime
P071	O,O-Dimethyl O-p-nitrophenyl phosphorothioate
P082	Dimethylnitrosamine
P046	alpha, alpha-Dimethylphenethylamine
P047	4,6-Dinitro-o-cresol and salts
P034	4,6-Dinitro-o-cyclohexylphenol
P048	2,4-Dinitrophenol
P020	Dinoseb
P085	Diphosphoramide, octamethyl-
P039	Disulfoton
P049	2,4-Dithiobiuret
P109	Dithiopyrophosphoric acid, tetraethyl ester
P050	Endosulfan
P088	Endothall
P051	Endrin
P042	Epinephrine
P046	Ethanamine, 1,1-dimethyl-2-phenyl-
P084	Ethenamine, N-methyl-N-nitroso-
P101	Ethyl cyanide
P054	Ethylenimine
P097	Famphur
P056	Fluorine
P057	Fluoroacetamide
P058	Fluoroacetic acid, sodium salt
P065	Fulminic acid, mercury(II) salt (R,T)
P059	Heptachlor
P051	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene
P037	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-demethanonaphthalene
P060	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo, endo-dimethanonaphthalene
P004	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene
P060	Hexachlorohexahydro-exo,exo-dimethanonaphthalene
P062	Hexaethyl tetraphosphate
P116	Hydrazinecarbothioamide
P068	Hydrazine, methyl-
P063	Hydrocyanic acid
P063	Hydrogen cyanide
P096	Hydrogen phosphide
P064	Isocyanic acid, methyl ester
P007	3(2H)-Isoxazolone, 5-(aminomethyl)-
P092	Mercury, (acetato-O)phenyl-
P065	Mercury fulminate (R,T)
P016	Methane, oxybis(chloro-
P112	Methane, tetranitro- (R)
P118	Methanethiol, trichloro-
P059	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P066	Methomyl
P067	2-Methylaziridine
P068	Methyl hydrazine
P064	Methyl isocyanate
P069	2-Methyllactonitrile
P071	Methyl parathion
P072	alpha-Naphthylthiourea
P073	Nickel carbonyl
P074	Nickel cyanide
P074	Nickel(II) cyanide
P073	Nickel tetracarbonyl
P075	Nicotine and salts
P076	Nitric oxide
P077	p-Nitroaniline
P078	Nitrogen dioxide
P076	Nitrogen(II) oxide
P078	Nitrogen(IV) oxide
P081	Nitroglycerine (R)
P082	N-Nitrosodimethylamine
P084	N-Nitrosomethylvinylamine
P050	5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro, cyclic sulfite
P085	Octamethylpyrophosphoramide
P087	Osmium oxide
P087	Osmium tetroxide
P088	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089	Parathion
P034	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	Phenol, 2,4-dinitro-
P047	Phenol, 2,4-dinitro-6-methyl-
P020	Phenol, 2,4-dinitro-6-(1-methylpropyl)-
P009	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P036	Phenyl dichloroarsine
P092	Phenylmercuric acetate
P093	N-Phenylthiourea
P094	Phorate
P095	Phosgene
P096	Phosphine
P041	Phosphoric acid, diethyl p-nitrophenyl ester
P044	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl]ester
P043	Phosphorofluoric acid, bis(1-methylethyl)-ester
P094	Phosphorothioic acid, O,O-diethyl S-(ethylthio)methyl ester
P089	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester
P040	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P097	Phosphorothioic acid, O,O-dimethyl O-[p-((dimethylamino)-sulfonyl)phenyl]ester
P110	Plumbane, tetraethyl-
P098	Potassium cyanide
P099	Potassium silver cyanide
P070	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P101	Propanenitrile
P027	Propanenitrile, 3-chloro-
P069	Propanenitrile, 2-hydroxy-2-methyl-
P081	1,2,3-Propanetriol, trinitrate- (R)
P017	2-Propanone, 1-bromo-
P102	Propargyl alcohol
P003	2-Propenal
P005	2-Propen-1-ol
P067	1,2-Propylenimine
P102	2-Propyn-1-ol
P008	4-Pyridinamine
P075	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts
P111	Pyrophosphoric acid, tetraethyl ester
P103	Selenourea
P104	Silver cyanide
P105	Sodium azide

Hazardous waste No	Substance
P106	Sodium cyanide
P107	Strontium sulfide
P108	Strychnidin-10-one, and salts
P018	Strychnidin-10-one, 2,3-dimethoxy-
P108	Strychnine and salts
P115	Sulfuric acid, thallium(I) salt
P109	Tetraethyldithiopyrophosphate
P110	Tetraethyl lead
P111	Tetraethylpyrophosphate
P112	Tetranitromethane (R)
P062	Tetraphosphoric acid, hexaethyl ester
P113	Thallic oxide
P113	Thallium(III) oxide
P114	Thallium(I) selenite
P115	Thallium(I) sulfate
P045	Thiofanox
P049	Thioimidodicarbonic diamide
P014	Thiophenol
P116	Thiosemicarbazide
P026	Thiourea, (2-chlorophenyl)-
P072	Thiourea, 1-naphthalenyl-
P093	Thiourea, phenyl-
P123	Toxaphene
P118	Trichloromethanethiol
P119	Vanadic acid, ammonium salt
P120	Vanadium pentoxide
P120	Vanadium(V) oxide
P001	Warfarin, when present at concentrations greater than 0.3%
P121	Zinc cyanide
P122	Zinc phosphide (R,T)
P122	Zinc phosphide, when present at concentrations greater than 10%

(f) The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in paragraphs (a) through (d) of this section, are identified as toxic wastes (T) unless otherwise designated and are subject to the small quantity exclusion defined in § 261.5 (a) and (f).

[*Comment:* For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), R (Reactivity), I (Ignitability) and C (Corrosivity). Absence of a letter indicates that the compound is only listed for toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous Waste No	Substance
U001	Acetaldehyde (I)
U034	Acetaldehyde, trichloro-
U187	Acetamide, N-(4-ethoxyphenyl)-
U005	Acetamide, N-9H-fluoren-2-yl-
U112	Acetic acid, ethyl ester (I)
U144	Acetic acid, lead salt
U214	Acetic acid, thallium(I) salt
U002	Acetone (I)
U003	Acetonitrile (I,T)
U248	3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts, when present at concentrations of 0.3% or less
U004	Acetophenone
U005	2-Acetylaminofluorene
U006	Acetyl chloride (C,R,T)
U007	Acrylamide
U008	Acrylic acid (I)
U009	Acrylonitrile
U150	Alanine, 3-[p-bis(2-chloroethyl)amino] phenyl-, L-
U011	Amitrole
U012	Aniline (I,T)
U014	Auramine
U015	Azaserine
U010	Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione, 6-amino-8-[((aminocarbonyl) oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,
U157	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	Benz[c]acridine
U016	3,4-Benzacridine
U017	Benzal chloride
U018	Benz[a]anthracene
U018	1,2-Benzanthracene
U094	1,2-Benzanthracene, 7,12-dimethyl-
U012	Benzenamine (I,T)
U014	Benzenamine, 4,4'-carbonimidoylbis(N,N-dimethyl-
U049	Benzenamine, 4-chloro-2-methyl-
U093	Benzenamine, N,N'-dimethyl-4-phenylazo-
U158	Benzenamine, 4,4'-methylenebis(2-chloro-
U222	Benzenamine, 2-methyl-, hydrochloride
U181	Benzenamine, 2-methyl-5-nitro
U019	Benzene (I,T)
U038	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	Benzene, 1-bromo-4-phenoxy-
U037	Benzene, chloro-
U190	1,2-Benzenedicarboxylic acid anhydride
U028	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester
U069	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	1,2-Benzenedicarboxylic acid, diethyl ester
U102	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	1,2-Benzenedicarboxylic acid, di-n-octyl ester
U070	Benzene, 1,2-dichloro-
U071	Benzene, 1,3-dichloro-
U072	Benzene, 1,4-dichloro-
U017	Benzene, (dichloromethyl)-
U223	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	Benzene, dimethyl (I,T)
U201	1,3-Benzenediol
U127	Benzene, hexachloro-
U056	Benzene, hexahydro- (I)
U188	Benzene, hydroxy-
U220	Benzene, methyl-
U105	Benzene, 1-methyl-1-2,4-dinitro-
U106	Benzene, 1-methyl-2,6-dinitro-
U203	Benzene, 1,2-methylenedioxy-4-allyl-
U141	Benzene, 1,2-methylenedioxy-4-propenyl-
U090	Benzene, 1,2-methylenedioxy-4-propyl-
U055	Benzene, (1-methylethyl)- (I)
U169	Benzene, nitro- (I,T)
U183	Benzene, pentachloro-
U185	Benzene, pentachloro-nitro-
U020	Benzenesulfonic acid chloride (C,R)
U020	Benzenesulfonyl chloride (C,R)
U207	Benzene, 1,2,4,5-tetrachloro-
U023	Benzene, (trichloromethyl)- (C,R,T)
U234	Benzene, 1,3,5-trinitro- (R,T)
U021	Benzidine
U202	1,2-Benzisothiazolin-3-one, 1,1-dioxide
U120	Benzo[j,k]fluorene
U022	Benzo[a]pyrene
U022	3,4-Benzopyrene
U197	p-Benzoquinone
U023	Benzotrichloride (C,R,T)
U050	1,2-Benzphenanthrene
U085	2,2'-Bioxirane (I,T)
U021	(1,1'-Biphenyl)-4,4'-diamine
U073	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dichloro-
U091	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethoxy-
U095	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl-
U024	Bis(2-chloroethoxy) methane
U027	Bis(2-chloroisopropyl) ether
U244	Bis(dimethylthiocarbamoyl) disulfide
U028	Bis(2-ethylhexyl) phthalate
U246	Bromine cyanide
U225	Bromoform
U030	4-Bromophenyl phenyl ether
U128	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	1-Butanamine, N-butyl-N-nitroso-
U035	Butanoic acid, 4-[bis(2-chloroethyl)amino] benzene-
U031	1-Butanol (I)
U159	2-Butanone (I,T)
U160	2-Butanone peroxide (R,T)
U053	2-Butenal
U074	2-Butene, 1,4-dichloro- (I,T)
U031	n-Butyl alcohol (I)
U136	Cacodylic acid
U032	Calcium chromate
U238	Carbamic acid, ethyl ester
U178	Carbamic acid, methylnitroso-, ethyl ester
U176	Carbamide, N-ethyl-N-nitroso-
U177	Carbamide, N-methyl-N-nitroso-
U219	Carbamide, thio-
U097	Carbamoyl chloride, dimethyl-
U215	Carbonic acid, dithallium(I) salt
U156	Carbonochloridic acid, methyl ester (I,T)
U033	Carbon oxyfluoride (R,T)
U211	Carbon tetrachloride
U033	Carbonyl fluoride (R,T)
U034	Chloral
U035	Chlorambucil
U036	Chlordane, technical
U026	Chlornaphazine
U037	Chlorobenzene
U039	4-Chloro-m-cresol
U041	1-Chloro-2,3-epoxypropane
U042	2-Chloroethyl vinyl ether
U044	Chloroform
U046	Chloromethyl methyl ether
U047	beta-Chloronaphthalene
U048	o-Chlorophenol
U049	4-Chloro-o-toluidine, hydrochloride
U032	Chromic acid, calcium salt
U050	Chrysene
U051	Creosote
U052	Cresols
U052	Cresylic acid
U053	Crotonaldehyde
U055	Cumene (I)
U246	Cyanogen bromide
U197	1,4-Cyclohexadienedione
U056	Cyclohexane (I)
U057	Cyclohexanone (I)
U130	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	Cyclophosphamide
U240	2,4-D, salts and esters
U059	Daunomycin
U060	DDD
U061	DDT
U142	Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[c,d]-pentalen-2-one
U062	Diallate
U133	Diamine (R,T)
U221	Diaminotoluene
U063	Dibenz[a,h]anthracene
U063	1,2:5,6-Dibenzanthracene
U064	1,2:7,8-Dibenzopyrene
U064	Dibenz[a,i]pyrene
U066	1,2-Dibromo-3-chloropropane
U069	Dibutyl phthalate
U062	S-(2,3-Dichloroallyl) diisopropylthiocarbamate
U070	o-Dichlorobenzene
U071	m-Dichlorobenzene
U072	p-Dichlorobenzene
U073	3,3'-Dichlorobenzidine
U074	1,4-Dichloro-2-butene (I,T)
U075	Dichlorodifluoromethane
U192	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl) benzamide
U060	Dichloro diphenyl dichloroethane
U061	Dichloro diphenyl trichloroethane
U078	1,1-Dichloroethylene
U079	1,2-Dichloroethylene
U025	Dichloroethyl ether
U081	2,4-Dichlorophenol
U082	2,6-Dichlorophenol
U240	2,4-Dichlorophenoxyacetic acid, salts and esters
U083	1,2-Dichloropropane
U084	1,3-Dichloropropene
U085	1,2:3,4-Diepoxybutane (I,T)
U108	1,4-Diethylene dioxide
U086	N,N-Diethylhydrazine
U087	O,O-Diethyl-S-methyl-dithiophosphate
U088	Diethyl phthalate
U089	Diethylstilbestrol
U148	1,2-Dihydro-3,6-pyradizinedione
U090	Dihydrosafrole
U091	3,3'-Dimethoxybenzidine
U092	Dimethylamine (I)
U093	Dimethylaminoazobenzene
U094	7,12-Dimethylbenz[a]anthracene
U095	3,3'-Dimethylbenzidine
U096	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	Dimethylcarbamoyl chloride
U098	1,1-Dimethylhydrazine
U099	1,2-Dimethylhydrazine
U101	2,4-Dimethylphenol
U102	Dimethyl phthalate
U103	Dimethyl sulfate
U105	2,4-Dinitrotoluene
U106	2,6-Dinitrotoluene
U107	Di-n-octyl phthalate
U108	1,4-Dioxane
U109	1,2-Diphenylhydrazine
U110	Dipropylamine (I)
U111	Di-N-propylnitrosamine
U001	Ethanal (I)
U174	Ethanamine, N-ethyl-N-nitroso-
U067	Ethane, 1,2-dibromo-
U076	Ethane, 1,1-dichloro-
U077	Ethane, 1,2-dichloro-
U114	1,2-Ethanediylbiscarbamodithioic acid
U131	Ethane, 1,1,1,2,2,2-hexachloro-
U024	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U003	Ethanenitrile (I, T)
U117	Ethane, 1,1'-oxybis- (I)
U025	Ethane, 1,1'-oxybis[2-chloro-
U184	Ethane, pentachloro-

Hazardous Waste No.	Substance
U208	Ethane, 1,1,1,2-tetrachloro-
U209	Ethane, 1,1,2,2-tetrachloro-
U218	Ethanethioamide
U247	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)
U227	Ethane, 1,1,2-trichloro-
U043	Ethene, chloro-
U042	Ethene, 2-chloroethoxy-
U078	Ethene, 1,1-dichloro-
U079	Ethene, trans-1,2-dichloro-
U210	Ethene, 1,1,2,2-tetrachloro-
U173	Ethanol, 2,2'-(nitrosoimino)bis-
U004	Ethanone, 1-phenyl-
U006	Ethanoyl chloride (C,R,T)
U112	Ethyl acetate (I)
U113	Ethyl acrylate (I)
U238	Ethyl carbamate (urethan)
U038	Ethyl 4,4'-dichlorobenzilate
U114	Ethylenebis(dithiocarbamic acid)
U067	Ethylene dibromide
U077	Ethylene dichloride
U115	Ethylene oxide (I,T)
U116	Ethylene thiourea
U117	Ethyl ether (I)
U076	Ethylidene dichloride
U118	Ethylmethacrylate
U119	Ethyl methanesulfonate
U139	Ferric dextran
U120	Fluoranthene
U122	Formaldehyde
U123	Formic acid (C,T)
U124	Furan (I)
U125	2-Furancarboxaldehyde (I)
U147	2,5-Furandione
U213	Furan, tetrahydro- (I)
U125	Furfural (I)
U124	Furfuran (I)
U206	D-Glucopyranose, 2-deoxy-2(3-methyl-3-nitrosoureido)-
U126	Glycidylaldehyde
U163	Guanidine, N-nitroso-N-methyl-N'nitro-
U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U129	Hexachlorocyclohexane (gamma isomer)
U130	Hexachlorocyclopentadiene
U131	Hexachloroethane
U132	Hexachlorophene
U243	Hexachloropropene
U133	Hydrazine (R,T)
U086	Hydrazine, 1,2-diethyl-
U098	Hydrazine, 1,1-dimethyl-
U099	Hydrazine, 1,2-dimethyl-
U109	Hydrazine, 1,2-diphenyl-
U134	Hydrofluoric acid (C,T)
U134	Hydrogen fluoride (C,T)
U135	Hydrogen sulfide
U096	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U136	Hydroxydimethylarsine oxide
U116	2-Imidazolidinethione
U137	Indeno(1,2,3-cd)pyrene
U139	Iron dextran
U140	Isobutyl alcohol (I,T)
U141	Isosafrole
U142	Kepone
U143	Lasiocarpine
U144	Lead acetate
U145	Lead phosphate
U146	Lead subacetate
U129	Lindane
U147	Maleic anhydride
U148	Maleic hydrazide
U149	Malononitrile
U150	Melphalan
U151	Mercury
U152	Methacrylonitrile (I,T)
U092	Methanamine, N-methyl- (I)
U029	Methane, bromo-
U045	Methane, chloro- (I,T)
U046	Methane, chloromethoxy-
U068	Methane, dibromo-
U080	Methane, dichloro-
U075	Methane, dichlorodifluoro-
U138	Methane, iodo-
U119	Methanesulfonic acid, ethyl ester
U211	Methane, tetrachloro-
U121	Methane, trichlorofluoro-
U153	Methanethiol (I,T)
U225	Methane, tribromo-
U044	Methane, trichloro-
U121	Methane, trichlorofluoro-
U123	Methanoic acid (C,T)
U036	4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-
U154	Methanol (I)
U155	Methapyrilene
U247	Methoxychlor
U154	Methyl alcohol (I)
U029	Methyl bromide
U186	1-Methylbutadiene (I)
U045	Methyl chloride (I,T)
U156	Methyl chlorocarbonate (I,T)
U226	Methylchloroform
U157	3-Methylcholanthrene
U158	4,4'-Methylenebis(2-chloroaniline)
U132	2,2'-Methylenebis(3,4,6-trichlorophenol)
U068	Methylene bromide
U080	Methylene chloride
U122	Methylene oxide
U159	Methyl ethyl ketone (I,T)
U160	Methyl ethyl ketone peroxide (R,T)
U138	Methyl iodide
U161	Methyl isobutyl ketone (I)
U162	Methyl methacrylate (I,T)
U163	N-Methyl-N'-nitro-N-nitrosoguanidine
U161	4-Methyl-2-pentanone (I)
U164	Methylthiouracil
U010	Mitomycin C
U059	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-
U165	Naphthalene
U047	Naphthalene, 2-chloro-
U166	1,4-Naphthalenedione
U236	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)]-bis(azo)bis(5-amino-4-hydroxy)-,tetrasodium salt
U166	1,4-Naphthaquinone
U167	1-Naphthylamine
U168	2-Naphthylamine
U167	alpha-Naphthylamine
U168	beta-Naphthylamine
U026	2-Naphthylamine, N,N'-bis(2-chloromethyl)-
U169	Nitrobenzene (I,T)
U170	p-Nitrophenol
U171	2-Nitropropane (I)
U172	N-Nitrosodi-n-butylamine
U173	N-Nitrosodiethanolamine
U174	N-Nitrosodiethylamine
U111	N-Nitroso-N-propylamine
U176	N-Nitroso-N-ethylurea
U177	N-Nitroso-N-methylurea
U178	N-Nitroso-N-methylurethane

Hazardous Waste No.	Substance
U179	N-Nitrosopiperidine
U180	N-Nitrosopyrrolidine
U181	5-Nitro-o-toluidine
U193	1,2-Oxathiolane, 2,2-dioxide
U058	2H-1,3,2-Oxazaphosphorine, 2-[bis(2-chloroethyl)amino]tetrahydro-, oxide 2-
U115	Oxirane (I,T)
U041	Oxirane, 2-(chloromethyl)-
U182	Paraldehyde
U183	Pentachlorobenzene
U184	Pentachloroethane
U185	Pentachloronitrobenzene
See F027	Pentachlorophenol
U186	1,3-Pentadiene (I)
U187	Phenacetin
U188	Phenol
U048	Phenol, 2-chloro-
U039	Phenol, 4-chloro-3-methyl-
U081	Phenol, 2,4-dichloro-
U082	Phenol, 2,6-dichloro-
U101	Phenol, 2,4-dimethyl-
U170	Phenol, 4-nitro-
See F027	Phenol, pentachloro-
Do	Phenol, 2,3,4,6-tetrachloro-
Do	Phenol, 2,4,5-trichloro-
Do	Phenol, 2,4,6-trichloro-
U137	1,10-(1,2-phenylene)pyrene
U145	Phosphoric acid, Lead salt
U087	Phosphorodithioic acid, O,O-diethyl-, S-methylester
U189	Phosphorous sulfide (R)
U190	Phthalic anhydride
U191	2-Picoline
U192	Pronamide
U194	1-Propanamine (I,T)
U110	1-Propanamine, N-propyl- (I)
U066	Propane, 1,2-dibromo-3-chloro-
U149	Propanedinitrile
U171	Propane, 2-nitro- (I)
U027	Propane, 2,2'oxybis[2-chloro-
U193	1,3-Propane sultone
U235	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U126	1-Propanol, 2,3-epoxy-
U140	1-Propanol, 2-methyl- (I,T)
U002	2-Propanone (I)
U007	2-Propenamide
U084	Propene, 1,3-dichloro-
U243	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	2-Propenenitrile
U152	2-Propenenitrile, 2-methyl- (I,T)
U008	2-Propenoic acid (I)
U113	2-Propenoic acid, ethyl ester (I)
U118	2-Propenoic acid, 2-methyl-, ethyl ester
U162	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
See F027	Propionic acid, 2-(2,4,5-trichlorophenoxy)-
U194	n-Propylamine (I,T)
U083	Propylene dichloride
U196	Pyridine
U155	Pyridine, 2-[(2-(dimethylamino)-2-thenylamino]-
U179	Pyridine, hexahydro-N-nitroso-
U191	Pyridine, 2-methyl-
U164	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	Pyrrole, tetrahydro-N-nitroso-
U200	Reserpine
U201	Resorcinol
U202	Saccharin and salts
U203	Safrole
U204	Selenious acid
U204	Selenium dioxide
U205	Selenium disulfide (R,T)
U015	L-Serine, diazoacetate (ester)
See F027	Silvex
U089	4,4'-Stilbenediol, alpha,alpha'-diethyl-
U206	Streptozotocin
U135	Sulfur hydride
U103	Sulfuric acid, dimethyl ester
U189	Sulfur phosphide (R)
U205	Sulfur selenide (R,T)
See F027	2,4,5-T
U207	1,2,4,5-Tetrachlorobenzene
U208	1,1,1,2-Tetrachloroethane
U209	1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene
See F027	2,3,4,6-Tetrachlorophenol
U213	Tetrahydrofuran (I)
U214	Thallium(I) acetate
U215	Thallium(I) carbonate
U216	Thallium(I) chloride
U217	Thallium(I) nitrate
U218	Thioacetamide
U153	Thiomethanol (I,T)
U219	Thiourea
U244	Thiram
U220	Toluene
U221	Toluenediamine
U223	Toluene diisocyanate (R,T)
U222	O-Toluidine hydrochloride
U011	1H-1,2,4-Triazol-3-amine
U226	1,1,1-Trichloroethane
U227	1,1,2-Trichloroethane
U228	Trichloroethene
U228	Trichloroethylene
U121	Trichloromonofluoromethane
See F027	2,4,5-Trichlorophenol
Do	2,4,6-Trichlorophenol
Do	2,4,5-Trichlorophenoxyacetic acid
U234	sym-Trinitrobenzene (R,T)
U182	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	Tris(2,3-dibromopropyl) phosphate
U236	Trypan blue
U237	Uracil, 5[bis(2-chloromethyl)amino]-
U237	Uracil mustard
U043	Vinyl chloride
U248	Warfarin, when present at concentrations of 0.3% or less
U239	Xylene (I)
U200	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-, methyl ester
U249	Zinc phosphide, when present at concentrations of 10% or less

[45 FR 78529, 78541, Nov. 25, 1980, as amended at 46 FR 27477, May 20, 1981; 49 FR 19923, May 10, 1984; 49 FR 665, Jan. 4, 1985; 50 FR 2000, Jan. 14, 1985]

EFFECTIVE DATE NOTE: At 50 FR 665, Jan. 4, 1985, § 261.33 introductory text was revised, effective July 5, 1985. At 50 FR 2000, Jan. 14, 1985, the table in paragraph (f) was amended by revising certain hazardous waste numbers, effective July 15, 1985. For the convenience of the user, the superseded introductory text (published at 49 FR 37070, Sept. 21, 1984), and entries in the paragraph (f) table, are set out below.

§ 261.33

§ 261.33 Discarded commercial chemical products, off-specification species, container residues and spill residues thereof.

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded unless they are excluded under §§ 260.20 and 260.22 and listed in Appendix IX.

* * * * *

(f) * * *

Hazardous waste No.	Substance
*	* * * *
U242	Pentachlorophenol
*	* * * *
U242	Phenol, pentachloro-
U212	Phenol, 2,3,4,6-tetrachloro-
U212	Phenol, 2,4,5-trichloro-
U230	Phenol, 2,4,6-trichloro-
*	* * * *
U231	Propionic acid, 2-(2,4,5-trichlorophenoxy)-
*	* * * *
U233	Silvex
*	* * * *
U232	2,4,5-T
*	* * * *
U212	2,3,4,6-Tetrachlorophenol
*	* * * *
U230	2,4,5-Trichlorophenol
U231	2,4,6-Trichlorophenol
U230	2,4,5-Trichlorophenoxyacetic acid
*	* * * *

APPENDIX B

40 CFR PARTS 261.21 THROUGH 261.24

§ 261.21 Characteristic of ignitability.

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (incorporated by reference, see § 260.11), or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78 (incorporated by reference, see § 260.11), or as determined by an equivalent test method approved by the Administrator under procedures set forth in §§ 260.20 and 260.21.

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D001.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981]

§ 261.22 Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using either an EPA test method or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21. The EPA test method for pH is specified as Method 5.2 in "Test Methods for the Evaluation of Solid Waste," Physical/Chemical Methods" (incorporated by reference, see § 260.11).

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (incorporated by reference, see § 260.11) or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(b) A solid waste that exhibits the characteristic of corrosivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981]

§ 261.23 Characteristic of reactivity.

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D003.

§ 261.24 Characteristic of EP toxicity.

(a) A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Appendix II or equivalent methods approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in Table I at a concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of this section.

(b) A solid waste that exhibits the characteristic of EP toxicity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

TABLE I—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0
D012	Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimethano-naphthalene	0.02
D013	Lindane (1,2,3,4,5,6-hexa-chlorocyclohexane, gamma isomer	0.4
D014	Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenyl)ethane)	10.0
D015	Toxaphene ($C_{10}H_{10}Cl_8$, Technical chlorinated camphene, 67-69 percent chlorine)	0.5

TABLE I—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY—Continued

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D016	2,4-D, (2,4-Dichlorophenoxyacetic acid)	10.0
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	1.0

APPENDIX C

DIRECTORY TO PROGRAMS

DIRECTORY TO PROGRAMS

State	Sponsoring/Administrating Organization	Contact Name/No.
Alabama	Waste Management Emmelle, AL 35459	Gordon Kinna (205) 652-6721
Alaska	Alaska Department of Environmental Conservartion 600 East 38th Street Anchorage, AK 99508	Jim Sweeney (907) 564-1336
California	League of Women Voters 132 Anita Court Redlands, CA 92373	Joan Dotson (714) 793-1164
	Golden Empire Health Planning Center 2100 21st Street Sacramento, CA 95818	Gina Purin (916) 731-5050
	City of Palo Alto Water Control District 2501 Embarcardero Mall Palo Alto, CA 94303	Pete Burnes (415) 329-2117
	San Diego Environmental Health Coalition P.O. Box 8426 San Diego, CA 92102	Chris Walker (619) 235-0281
	Environmental Health Services San Bernardino County 385 N. Arrowhead San Bernardino, CA 92415	Steve Van Stockum (714) 383-7170
Colorado	Department of Health (Tri-County Area) Fort Collins, CA 80521	Danny Stubbs/GSX (808) 251-1227
Connecticut	(Joint Funding with Department of Environmental Protection) Conservation Commission/Health Department Mansfield, CT 06250	Leslie Lewis (203) 566-3489 Steve Brown (203) 438-8653
	Conservation Commission Ridgefield, CT 06877	Lillian Willis (203) 438-8653

State	Sponsoring/Administrating Organization	Contact Name/No.
Connecticut (continued)	Towns of Weston and Westport (joint venture) Weston Board of Selectman and Westport Fire Department, CT 06880	Helen Speck Bd. of Selectman (203) 222-2682 Fire Department (203) 227-4161
	Health Department Town of Greenwich Greenwich, CT 06830	Bob Brown (203) 222-7848
	Conservation Commission and Town of Williston (joint venture) Ridgefield, CT 06877	Lillian Willis (203) 438-8653
	Conservation Commission Manchester, CT 06040	Art Glaeser (203) 647-3560
	Conservation Commission Farmington, CT 06032	Steve Kushner (203) 673-8237
	Conservation Commission/League of Women Voters Southington, CT 06489	Joanne Foster LWV (203) 628-2004
	Bershire-Litchfield Environmental Council Towns of Salisbury and Sharon, CT 06068	Victoria Givotovsky (203) 435-2004
	Northwest Connecticut Regional Planning Agency P.O. Box 198 Brooklyn, CT 06234 (special task force to sponsor an 8 town program-still in planning stages)	Nancy Kriz (203) 774-1253
Florida	Department of Environmental Regulation Solid and Hazardous Waste Section 2600 Blairstone Road Tallahassee, FL 32301	Jan Kleman (904) 487-3892
Indiana	GSX Corporation, Inc. Marion County, IN	Danny Stubbs/GSX (800) 251-1227

State	Sponsoring/Administrating Organization	Contact Name/No.
Indiana (continued)	GSX Corporation, Inc. Zionsville, IN	Danny Stubbs/GSX (800) 251-1227
Kentucky	Louisville Sewer District 4522 Algonquian Parkway Louisville, KY 40211	John Weil (502) 587-0591
	Marion County Health Department 516 N. Spawlding Lebanon, KY 40033	Keith Brock (502) 692-3393
Louisiana	Dow Chemical Corporation Plaquemine, LA 70764	Jerry Martin (504) 389-1696
Maryland	GSX Corporation, Incorporated Laurel, MD 20707	Mora Bartletti (800) 638-4440
Massachusetts	League of Women Voters 8 Winter Street Boston, MA 02108	Dana Duxbury (617) 475-8881
	- Cape Cod (all 15 towns)	" "
	- Martha's Vineyard (all 6 towns)	" "
	- Cohassett	" "
	- Plymouth	" "
	- Mattapoisett	" "
	- Wareham	" "
	- Marshfield	" "
	- Duxbury	" "
	- Marion	" "
	- Brockton	" "
	- Easton	" "
	- Attleborough	" "
	- Westport	" "
	- Fairhaven	" "
	- Taunton	" "
	- Raynham	" "
	- Seekonk	" "
	- Dartmouth	" "
	- Northborough	" "
	- Southborough	" "
	- Marlborough	" "
	- Watertown	" "
	- Newton	" "
	- Lexington	" "

State	Sponsoring/Administrating Organization	Contact Name/No.
Massachusetts (continued)	- Concord	" "
	- Lincoln	" "
	- Westford	" "
	- Acton	" "
	- Andover	" "
	- Pepperell	" "
	- Holden	" "
	- Oxford	" "
	- Ashby	" "
	- Lunenburg	" "
	- Fitchburg	" "
	- Townsend	" "
	- Amherst	" "
	- Northampton	" "
	- Longmeadow	" "
	- Easthampton	" "
	- Pelham	" "
	- Westfield	" "
	- Wilbraham	" "
	- Franklin County (all 26 towns)	" "
	- Dalton	" "
	- North Adams	" "
	- Williamstown	" "
	- South Berskshire County (all 16 towns)	" "
Michigan	Dow Chemical Corporation Midland Division 2020 HHD Center Midland, MI 48640	Bobby Weaver (517) 636-3413
	GSX, Incorporated Traverse City, MI 49684	Danny Stubbs/GSX (800) 251-1227
	Kalamazoo County Department Of Planning 201 W. Kalamazoo Avenue Kalmazoo, MI 49007	Dean Holub (616) 384-8112
	Contractor: Drug & Laboratory Disposal Plainwell, Michigan 49080	(616) 685-9824

State	Sponsoring/Administrating Organization	Contact Name/No.
Michigan (continued)	Kent County Department of Public Works 1500 Scribner Avenue, NW Grand Rapids, MI 49504	Curt Kemppainen
	Contractor: Mid-America Environment Service, Inc.	(312) 841-7020
	Ingham County Health Department 5303 S. Cedar Street, Box 30161 Lansing, MI 48909	Robert Godbold (517) 887-6988
	Contractor: Drug & Laboratory Disposal Plainwell, MI 49080	(616) 685-9824
	Oakland County Health Department 1200 North Telegraph Pontiac, MI 48053	Ron Grimes (313) 858-1322
	Contractor: Wayne State University Environmental Health & Safety Department	(313) 577-1200
	Washtenaw County Health Department P.O. Box 8645 Ann Harbor, MI 48107 Contractor: Wayne State University Environmental Health & Safety Department	Barry Johnson (313) 992-2492
	Wayne County Health Department 3669 Metro Place Mall Wayne, MI 48184	Bruce Davis (313) 326-4900
	Contractor: Wayne State University Environmental Health & Safety Department	(313) 577-1200
Minnesota	Minnesota Waste Management Board 123 Thorson Community Center 7232 58th Avenue North Crystal, MN 55428	Wayne Sames (612) 536-0816
Missouri	Monsanto, State of Missouri, League of Women Voters Missouri Environmental Coalition League of Women Voters 6665 Delmar Room 304 St. Louis, MO 63130	Leonore Loeb (314) 727-8674
New Jersey	New Jersey Hazardous Waste Advisement Commission (pesticides only)	Shirley Schifmann (609) 292-1250

State	Sponsoring/Administrating Organization	Contact Name/No.
New Jersey (continued)	League of Women Voters Bridgewater County, NJ	Linda Patchept (201) 649-4541
	League of Women Voters Flemington, NJ 08822	Kelly Martin (201) 649-4541_
New Mexico	City of Albuquerque Environmental Health and Energy Department Hazardous Waste Program P.O. Box 1293 924 Park Avenue, S.W. Albuquerque, NM 87103	Donna Lacombe (505) 766-7434 Jose B.R. Anglada (505) 766-7434
New York	CECOS International, Incorporated 9303 Montgomery Road Cinncinati, OH 45242 (collection held in Buffalo)	Laura Evans (513) 793-3090
North Carolina	GSX, Incorporation Reidsville, NC 27320	Mark Johnson (800) 334-5953
Ohio	CECOS, International 9303 Montgomery Road Cincinnati, OH 45242	Laura Evans (513) 793-3090
	League of Women Voters 2777 Blackfriar N. W. Canton, OH 44708	Patricia Starr (216) 400-3657
	Council on Hazardous Materials 4115 Bridge Avenue Cleveland, OH 44113	Bob Staib (216) 961-4646
	Cuyahoga County Division of Community Services 6100 W. Canal Road Valley View, OH 44125	Floyd Kincy (216) 524-6320
Rhode Island	Department of Environmental Management Air & Hazardous Materials Cannon Building 75 Davis Street Providence, RI 02908	John Hartley (401) 277-2797

State	Sponsoring/Administrating Organization	Contact Name/No.
Tennessee	GSX, Incorporated Greenbriar, TN 37073	Danny Stubbs/GSX (800) 251-1227
Vermont	Montshier Museum of Science 45 Lyme Road Hanover, NH 03755	Margy Erdman (603) 643-5672
Virginia	Department of Wastewater Treatment Commonwealth of Virginia County of Fairfax Department of Public Works 10640 Page Avenue Fairfax, VA 22030	Robin Byrd (703) 691-3381
	GSX, Incorporated Roanoke, VA	Nick Culian (919) 342-6106
Washington	Washington Metro 821 Second Avenue Seattle, WA 98104	David Galvin (206) 447-5878
	Tacoma-Pierce County Health Department 3679 S. "D" Street Tacoma, WA 98408	Doug Pierce (206) 591-6571
	Seattle/King County Health Department 400 Yesler Building Seattle, WA 98104	Wally Swofford (206) 587-2722 Cheri Zehner (206) 587-4632
Wisconsin	Brown County Emergency Government P.O. Box 1600 Green Bay, WI 54305 Contractor: GSX	Colette Mesiter Blum (414) 436-3393
	City of Kenosha 625 52nd Street Kenosha, WI 53140 Contractor: GSX	George Zimmer (414) 8170
	City of Madison Public Health Department 210 Monona Avenue Madison, WI 53710 Contractor: GSX	Jill Schmidt (608) 266-4843

State	Sponsoring/Administrating Organization	Contact Name/No.
Wisconsin (continued)	Department of Natural Resources Box 7921 Madison, WI 53707	Barbara Zellmer (608) 266-7017
	GSX, Incorporated - Madison County - Kenosha County - Marathon County - Manitowak County - Brown County	Danny Stubbs/GSX (800) 251-1227
	- Manitowoc County - Solid Waste Department - 1010 S. 8th Street - Maniltowoc, WI 54220 - Contractor: GSX	Jeff Beyer (414) 683-4085

APPENDIX D
CASE STUDIES OF HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAMS

ALBUQUERQUE, NEW MEXICO

INTRODUCTION

In 1980, two municipal wells were shut down by the Water Resources Department in the City of Albuquerque due to a high concentration of organic pollutants.(1) Improper disposal of HHW was suspected as a cause. The Environmental Health and Energy Department of the City of Albuquerque began a study to determine the possible causes of the pollution. The results of the 1982 residential portion of a hazardous waste study revealed that there was a need for increased public education on the subject of HHW. This became the main goal of a HHW collection program. In December of 1984, the City Council of Albuquerque passed a special appropriations bill to fund a collection program.(2) Additional monies were provided by the Bernalillo County Commission.(3)

The collection program was scheduled for the five-day period, October 18-22, 1985. This included one weekend to encourage participation. A local chemical firm donated the use of its facility as the collection site. The site was in an industrial portion of Albuquerque and had good physical security. A hazardous waste management firm was contracted to identify, package, transport and dispose of the wastes collected.

PUBLICITY

The City began an extensive public education program on the hazards of HHW and the effect on the environment from improper disposal of these wastes. The efforts began nearly 6 months prior to the collection days, and required nearly the full-time efforts of the program coordinator. Publicity involved three general approaches:

- Public presentations
- Printed material
- Radio and television announcements

The program coordinator developed an audio-slide presentation that stressed environmental concerns related to HHW, helped residents identify wastes, and explained the planned collection program. Although the slide show was based on one developed by the League of Women Voters in Massachusetts, local slides and a local news reporter as narrator were effective steps to customize the material. The presentation was given at meetings of over 150 local organizations such as Lions and Women's Clubs. Each attendee was also given a refrigerator magnet as a reminder of the dates and location of the collection program.

Printed material included the usual posters, flyers, and other handout materials. Announcements were also posted on 40 municipal buses. Inserts were put into water bills in both July and September. Thus, virtually everyone in Albuquerque was at least exposed to written material announcing the collection effort. Other media publicity included radio and public service announcements. A 60-second animated TV spot was broadcast on local stations. Examples of the publicity materials appear in Exhibit 1.

The City gave the program an official kick-off with a news conference covered by all local television stations and newspapers. Additionally, the mayor issued an executive order proclaiming October 18-22, 1985 as "Hazardous Waste-Wise Days".(5)

CONTRACTOR SELECTION

Each prospective contractor was to submit a proposal by April 6, 1985. Proposals were to include copies of all insurance coverage, state and Federal registrations, and a detailed breakdown of all costs associated with this program. Criteria for the selection of the contractor included past experience in this type of program and ability to comply with State and Federal environmental and transportation laws, cost-effectivness of the management of all areas of the project, and proper insurance coverage.(4)

CONTRACTOR'S AND AGENCY'S RESPONSIBLITIES

The contractor's responsibilities included all those services needed to collect, analyze, package, transport and dispose of the HHW.(4) This included identification of an unknown substance by appropriate means. Materials including drums, overpacks and absorbent were also the responsibility of the contractor. Other equipment including safety equipment for personnel, first aid equipment and drum pumping equipment were also required. The contractor maintained a daily log of all accepted wastes and any compatability or other types of tests run on the HHW.

The City of Albuquerque provided the personnel for reception, inventory, public information, participant interviews, and administration. Others not on-site, but aware of the project in case of an incident were the Fire Department and the Police Department.

Equipment provided by the City included the Environmental Improvement Division's Hazards Van, drum handling equipment including a forklift and operator, labels, eyewash and shower, wooden pallets, emergency spill materials, tables, chairs, and traffic routing equipment.

COLLECTION SITE

The site was located at the Rinchem Corporation, a chemical transportation company in the northeast quandrant of the city. A diagram of the collection site is in Exhibit 2. Rinchem Corporation donated the use of its property. The site is a secure area surrounded by a tall fence with a gate that was locked when the collection site was not open. This eliminated the need to hire a security guard. It was also located far enough away from congested areas to minimize traffic hazards. Signs directing traffic to the site were placed in such a way that they were visible to any traffic approaching the site from any conceivable direction. This included all cross streets as well as the main thoroughfares.

EXHIBIT 1. EXAMPLE OF ALBUQUERQUE, NEW MEXICO'S PUBLICITY MATERIALS

THE PROBLEM

Solvents, paints, pesticides, and other household products can pollute Albuquerque's groundwater resources if disposed of improperly. All of Albuquerque's drinking water is from groundwater. An estimated 1.6 million pounds of hazardous waste are being generated annually by households in Albuquerque. About 1.4 million pounds of this waste are being disposed of improperly into the sanitary landfill and sewer systems, or arroyos and open spaces, thus increasing the threat to public health and the environment. Albuquerque's hazardous waste problem is everybody's problem. It's time for action!

WHAT ARE HAZARDOUS MATERIALS?

Hazardous materials include corrosive, reactive, ignitable and toxic materials that can present a threat to public health and safety, and the environment. You probably have some in your home — on shelves in your garage, in the cabinets, and in work and storage sheds. These will be accepted at the Albuquerque H2HwC Project:

- Banned or unwanted insecticides
- Herbicides or weed killers
- Fungicides
- Old paint, paint thinners and strippers
- Solvents
- Wood preservatives
- Brake fluid and antifreeze
- Swimming pool chemicals
- Cleaning fluids, bleaches, and ammonia

Take used motor oil to a local recycling site

WHY IS PROPER DISPOSAL IMPORTANT?

Proper disposal prevents pollution of the city's sensitive environment which is susceptible to groundwater contamination. ***Our groundwater is the only water we have, so we have to be very protective of it.*** Improper disposal of hazardous household wastes — such as burying the waste — presents the potential for toxic substances to reach drinking water supplies. Individual acts of contamination such as a single can of paint poured down the drain, when multiplied thousands of times over, pose a threat to the water supply. Pouring waste down household drains allows the material to get into the sewage treatment plant or your septic tank and eventually into groundwater. Sewage treatment plants are not designed to treat hazardous materials. Hazardous material in household trash is taken to the landfill which can allow toxic chemicals to reach groundwater, since the landfill is not designed for hazardous waste disposal.

HOW SHOULD I TRANSPORT MY HAZARDOUS WASTE?

Label the material. Every effort should be made to identify the material. If you do not know what it is, mark it "unknown". Check all containers and make sure the lids are tight. If containers are leaking, pack in a larger container and use an absorbent material such as cat litter to soak up leaks. For example, place a one quart container in a clean one gallon paint can available at local paint stores and surround with absorbent material. Boxes with dividers make good packaging. ***Don't mix different or unknown materials together.*** For longer term storage, store in a cool dry place. Many chemicals, especially those in cardboard packaging, can absorb moisture.

HOW CAN I LEARN MORE?

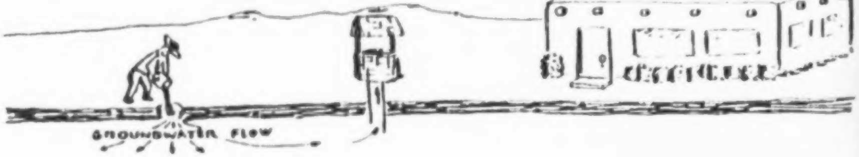
Call the Environmental Services Division of the Albuquerque Environmental Health and Energy Department at 766-7434. The Hazardous Waste Collection Project is not the ultimate solution to Albuquerque's hazardous waste collection and disposal problem. It is the first step towards ensuring safe management of hazardous waste in our community. You are encouraged to participate in local hazardous waste management decisions and become aware of and involved in the proper management of hazardous waste. The quality of our drinking water and natural resources tomorrow depends on each of us making the commitment toward a clean environment today.

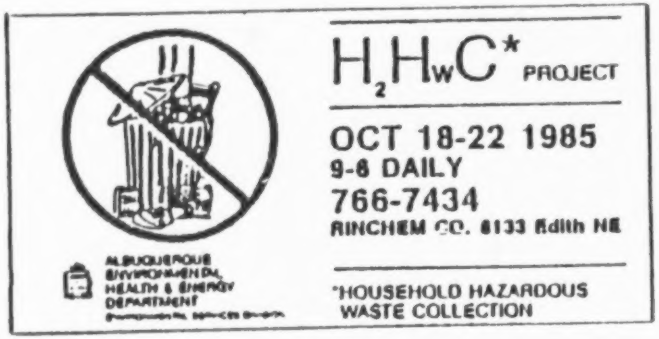
WHEN

can I take my hazardous waste to the collection area?
October 18 - 22, 1985, from 9:00 to 6:00 daily.

WHERE

is the collection area?
Rinchem Co., 6133 Edith NE [illegible]





H_2H_wC* PROJECT

OCT 18-22 1985
9-6 DAILY
766-7434
RINCHEM CO. 6133 Edith NE

*HOUSEHOLD HAZARDOUS
WASTE COLLECTION

ALBUQUERQUE
ENVIRONMENTAL
HEALTH & ENERGY
DEPARTMENT
[illegible]

REFRIGERATOR MAGNET

EXHIBIT 1 (Continued)

HAZARDOUS WASTE IN MY HOME

1. Why should I be concerned with household hazardous waste?

To protect your family and pets.
To protect our environment.
To reduce the amount of hazardous waste generated.

2. What are household hazardous wastes?

Substances which are toxic, corrosive, or flammable and capable of causing serious illness or harm to humans, domestic livestock, wildlife, or the environment.

While most packages offer adequate instructions on the storage and use of these potentially dangerous materials, they rarely contain instructions on how to dispose of them.

3. What can I do. . .

when buying toxic materials?

Read the label carefully.
Buy only as much as you need.
Use up all the materials for their intended purpose.
Keep separate from groceries, i.e., carry in car trunk.

in the event of spillage of toxic materials?

Sweep or shovel dust and powders into a plastic bag.
Spread sand, sawdust, or cat litter on liquids to absorb spillage and then shovel into plastic bag.

with unused toxic materials?

Must not be thrown in the trash.
Must not be flushed down the drain or toilets.
Must not be burned.
Store in safe place in the original labeled container.

ENVIRONMENTAL SERVICES DIVISION
ENVIRONMENTAL HEALTH & ENERGY DEPARTMENT
ALBUQUERQUE, NEW MEXICO

HOW TO IDENTIFY A HAZARDOUS WASTE PRODUCT

Check the label on the container. Look for key words: CORROSIVE, POISON, FLAMMABLE, COMBUSTIBLE, CAUSTIC, VOLATILE, EXPLOSIVE, OR OXIDIZER. Federal law requires products to be labelled with their contents and any dangers about them.

The following is a partial list of household hazardous wastes and their toxic effects:

Drain Openers	Corrosive
Oven Cleaners	Corrosive
Toilet Bowl Cleaners	Corrosive
Ammonia & Ammonia Based Cleaners	Corrosive
Lye	Corrosive
Pool Acids	Corrosive
Photographic Chemicals	Corrosive
Floor & Furniture Polish	Flammable
Spot Remover/Dry Cleaning Fluids	Flammable
Disinfectants	Flammable
Rug/Upholstery Cleaner	Flammable/Corrosive
Air Freshener	Flammable/Irritant
Aerosols	Flammable
Automotive Waste Oil	Flammable
Brake Fluid	Flammable
Transmission Fluid	Flammable
Diesel Fuel	Flammable
Enamel/Oil Base Paint	Flammable
Paint Solvents or Thinners	Flammable
Glass Cleaners	Irritant
Anti-Freeze	Poison
Pesticides	Poison
Chlorine	Oxidizer

ENVIRONMENTAL SERVICES DIVISION
ENVIRONMENTAL HEALTH & ENERGY DEPARTMENT
ALBUQUERQUE, NEW MEXICO

Recycle Your Used Motor Oil...

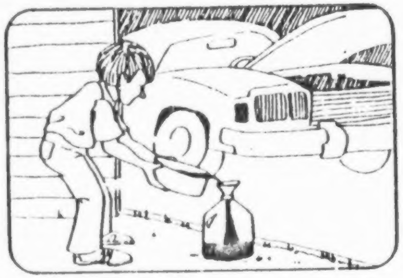
It makes good sense!

Recycling
Protects Our Environment
and
Conserves Energy

Why should I recycle used oil?

It protects our environment Oil dumped down the sewer, in the trash, or on the ground can eventually find its way into our water supply. Used oil contains many contaminants some harmful to human health

How difficult is it to collect used oil for recycling?

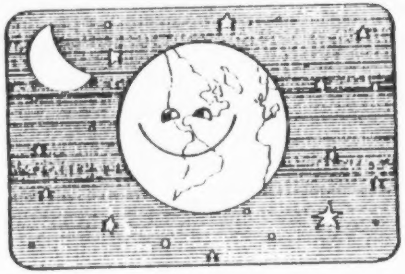


It's very simple Drain your oil into a clean container with a tight-fitting cap (one-gallon plastic milk jug) Do not mix the recovered oil with any other liquids Make sure it is free from dirt leaves or other debris

Where do I take my used oil to have it recycled?

Take your used oil to any location listed on this brochure

Why do so many businesses want used motor oil?



Used oil, the kind that is changed from autos lawn mowers and motorcycles is a valuable resource Every gallon recycled is one less gallon that must be produced from a dwindling world supply and one less that must be imported Recycling also saves energy Only about half as much energy is required to recycle used oil than is needed to produce new oil

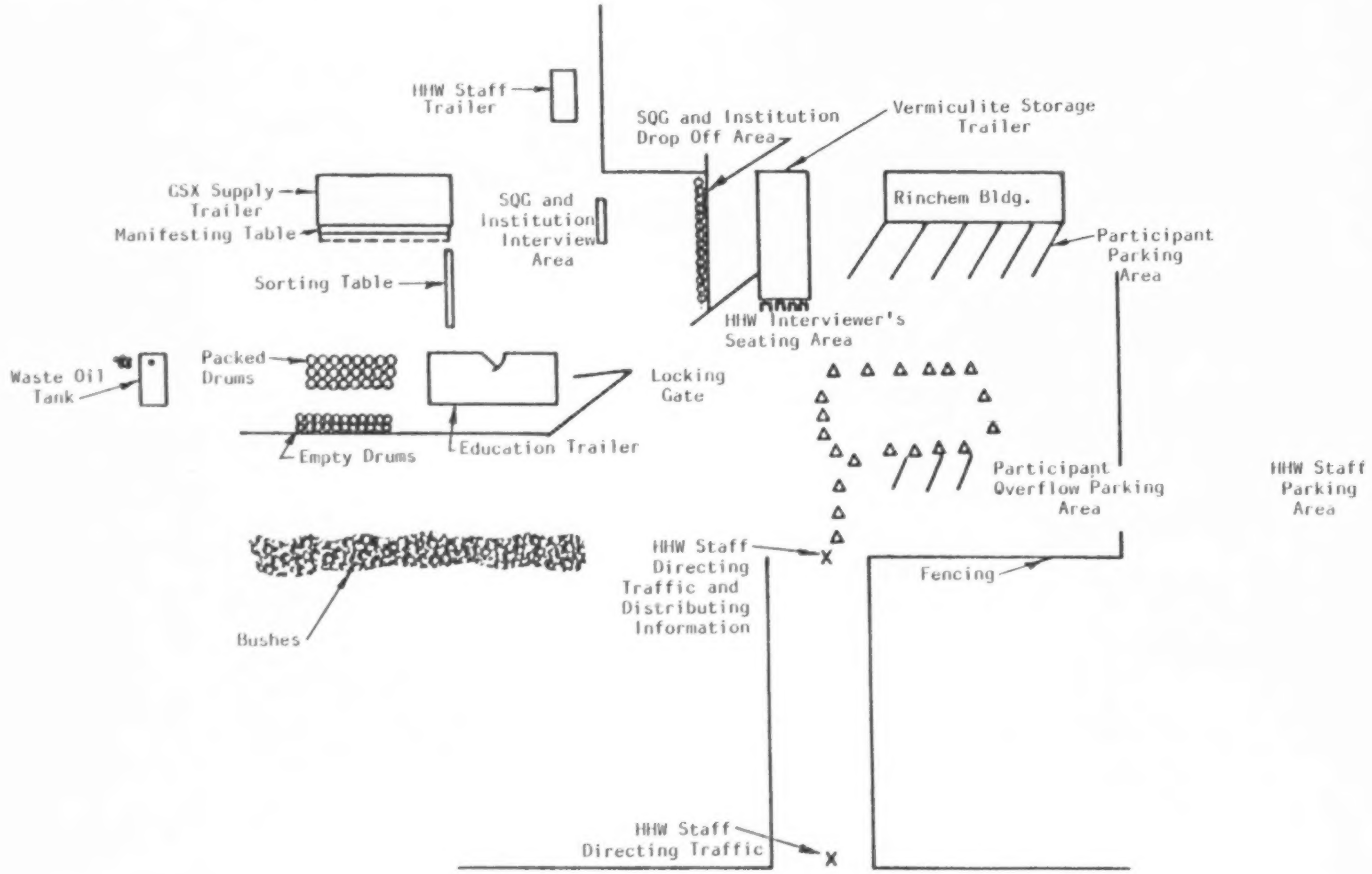
EXHIBIT 1 (Continued)

SUBSTITUTES FOR COMMON HOUSEHOLD HAZARDOUS PRODUCTS

PRODUCT	ALTERNATIVES
Household Cleaners	
Drain Openers	Pour boiling water down the drain a couple of times a week as a preventative measure. Unclog drains with a metal snake or plunger.
Oven Cleaners	Keep oven clean as you use it. Ovens can be cleaned with diluted ammonia or baking soda. Mix 3 tablespoons washing soda with one quart of warm water. Sprinkle salt on spills when they are warm then scrub. For baked on grease, put 1/4 cup ammonia in oven overnight to loosen, then scrub with baking soda.
Toilet Bowl Cleaners	A general household cleaner or baking soda can be used. 1/2 cup of bleach can be used as a cleaner or use a pumice stone for hard water spots.
Floor/Furniture Polishers	Light, soapy water to clean and a soft cloth to shine. Melt 1 tbsp of Carnauba Wax into 2 cups mineral oil or dissolve 1 tsp lemon oil into 1 pint of mineral oil or rub crushed raw nuts on the wood for an oily polish. Use a soft cloth and mayonnaise.
Ammonia & Ammonia-based Cleaners	Vinegar with salt and water is a good general surface cleaner. Dissolved baking soda does well in the bathroom and for cleaning coffee pots, chrome, copper and tile. Well-diluted ammonia is a good general household cleaner.
Glass Cleaners	Warm water and vinegar in an 8-to-1 solution. Use cornstarch and water. Use lemon juice and dry with a soft cloth.
Chlorine Bleach	Never mix with ammonia products. Baking soda and water is a safer cleaner.
Disinfectants	Dilute bleach: 1/4 cup to 1 qt water.
Rug & Upholstery Cleaners	Dry cornstarch sprinkled on rug and vacuumed up or use soap-based non-aerosol rug shampoos. Always wear gloves.
Air Fresheners	An open box of baking soda in the refrigerator. Set vinegar out in open dish.
Copper Cleaner	Pour vinegar and salt over copper and rub.
Silver Cleaner	Soak silver in 1 qt warm water continuing 1 tsp baking soda, 1 tsp salt, and a piece of aluminum foil.
Paint Products	
Paints	Use latex or water-based paints if possible.
Paint Solvents & Thinners	Latex and water-based paints do not require thinners.
Pesticides	
Ant Control	Sprinkle cream of tartar in front of the ant's path.
Bug Spray	Place screens on windows and doors. Brewers yeast tablets taken daily give the skin a scent that mosquitos seem to avoid.
Flea Repellent	Place eucalyptus seeds and leaves around the area where the animal sleeps. A bandana soaked in penny royal tea will repel fleas.
Rat Poison	Put a screen over drains. Use mechanical-snap mouse traps.
Snail/Slug Bait	Place a shallow pan with beer in the infested area. Overturn claypots. The snails will take shelter in them during the sunny days and they can be collected and removed.
Roach Spray	Chopped bay leaves and cucumber skins, or boric acid, or 1 part borax and 1 part brown sugar set out in dishes.
Mothballs	Spread newspapers around closets or put clothes in cedar chests or place cedar chips around clothes.
Houseplant Insecticides	Soapy water on leaves--then rinse.

ENVIRONMENTAL SERVICES DIVISION
ENVIRONMENTAL HEALTH & ENERGY DEPARTMENT
ALBUQUERQUE, NEW MEXICO

EXHIBIT 2. DIAGRAM OF ALBUQUERQUE, NM HOUSEHOLD HAZARDOUS WASTE COLLECTION SITE


HHW Staff Trailer
SQG and Institution Drop Off Area
Vermiculite Storage Trailer
GSX Supply Trailer
Manifesting Table
SQG and Institution Interview Area
Rinchem Bldg.
Participant Parking Area
Sorting Table
HHW Interviewer's Seating Area
Waste Oil Tank
Packed Drums
Locking Gate
Empty Drums
Education Trailer
Participant Overflow Parking Area
HHW Staff Parking Area
HHW Staff Directing Traffic and Distributing Information
Fencing
Bushes
HHW Staff Directing Traffic

The contractor's facility consisted of a single trailer with a canopy over processing tables. Tables were set up along the length of the trailer for processing of the HHW and testing any unknown substance. Another table, used for reception of the waste, prevented non-contractor personnel from entering the processing area. Two other trailers, one for contractor supplies and the other for storage of the bags of vermiculite for waste packaging were located nearby.

Other features of the collection site were a waste-oil tank located a safe distance from the processing area. Only City personnel were permitted near it. The education trailer was located next to the processing area. Participants could safely view overall collection activities and get additional information on HHW. At one end of the trailer a table contained flyers and information about household hazardous waste, including information about alternative, non-hazardous substitutions for household chemicals and cleaners. Additional information concerning the HHW situation as it pertains to Albuquerque including oil recycling together with a list of oil recycling locations in the Albuquerque area was also located on the table. At the other end of the trailer, the slide/tape presentation was shown to every participant that entered the trailer. Personnel were available in the trailer to answer any questions relating to HHW. If a question could not be answered by the personnel in the trailer, an attempt was made to locate someone on-site who could answer the question, or the participant was referred to the agency or person that would be able to assist him/her. A sample of the educational material is in Exhibit 2. Also on-site was the EID (Environmental Improvement Division) Hazards Van with facilities to cleanup any spill that might have occurred.

OPERATIONS

At the entrance to the site, a City employee routed traffic to the entrance of the collection area. At that point, another City employee gave the participant some general printed information on HHW and then directed him/her to a parking area. The participant was then interviewed and the waste inventoried. A City employee then removed the waste from the participant's vehicle and moved the waste to the processing site. The participant was given the option of visiting the education/information van, or leaving the site. If a participant had a large quantity of waste or was a small quantity generator, he was routed directly to the processing area. The wastes were inventoried and the participant was interviewed.

Small commercial generators and institutions were encouraged to participate. Receipt and processing of these wastes were completely separate from the HHW areas. Up to two 55-gallon drums of wastes were accepted at no charge from these sources. For more wastes, a discounted fee was charged by the contractor.(3)

A special feature of the Albuquerque program was a call-in service for some residents. Those who were elderly, handicapped, or had transportation difficulties could telephone the City for a special pick-up. City employees collected the wastes and hauled them back to the collection site.

WASTE TYPES

Program publicity identified the wastes that would be accepted and those that would not. Accepted wastes included:(4)

- Pesticides
- Poisons
- Household Cleaners and Polishes
- Drain Openers
- Paints
- Solvents/Thinners
- Wood Preservatives
- Furniture Strippers

Waste excluded from the collection program are as follows:

- Radioactive
- Biological
- Explosives
- Ammunition
- Motor Oil
- Gas Cylinders

Facilities were available on-site to process these wastes if a participant brought them:(3)

- Radioactive wastes were returned to manufacturers (e.g. stereo record cleaner, smoke alarm).

- Explosives and ammunition were placed in a "bomb box" that was on-site. These were then given to the Police Department for disposal.

- Motor oil was put into a 550 gallon tank on-site. An oil recycling firm provided the tank and emptied it when necessary.

- Aerosol cans were packed to be transported to an appropriate disposal facility.

LIABILITY

Several forms of insurance were involved. The owner of the collection site carried public liability insurance for activities on the property. The contractor carried its own insurance covering its employees during any period of time that the waste was handled. Also the contractor carried comprehensive general liability insurance for the equipment in use, including any vehicles. The City of Albuquerque employees were insured by the City's insurance policy. The fact that participants did not handle the wastes while at the collection site was an operational decision that reduced the possibility of an incident or accident.

RESULTS AND COSTS

Results of the Albuquerque collection program are shown in Exhibit 3. Over 1,000 households participated (about 0.8 percent of the households in the area). Some 66 other generators also participated including 57 commercial sources and nine schools. Over 59 tons of waste were collected with 39 percent coming from households and 61 percent from other sources.

Each household contributed about 46 lb of waste while each commercial source brought in nearly 1,100 lbs. This latter figure is the equivalent of about 146 gallons. Thus, although the program was primarily directed towards homeowners, most of the waste came from other sources.

Total program costs were estimated at about $146,500 as shown in Exhibit 4. This includes actual costs and estimated value of donations of the use of the collection site, donated labor, and volunteer labor. Exhibit 4 also includes cost factors for fringe benefits for City employees and for overall administration. These are costs that are often not included in other cost estimates of HHW collection programs.

Cost per pound of waste received was calculated as $1.24 based on total costs and total waste. There was no separate accounting of costs related to HHW and the other generators. However, the thrust of the program from inception was toward the homeowners. The program would have cost Albuquerque nearly the same if only HHW were accepted. If 90 percent of the costs were associated with HHW aspects, the cost to collect each pound of HHW would have been $2.85 ($146,525 x 0.9/$46,215 lb).

REFERENCES

(1) Residential Hazardous/Toxic Waste Survey, City of Albuquerque Environmental Health and Energy Department, Albuquerque, NM, 1983.

(2) Press Conference Announcement, Councilor Nadyne Bicknell, City Council Albuquerque, Albuquerque, NM, July 17, 1985.

(3) Personal Communication, Donna Lacombe, Environmental Health and Energy Department, City of Albuquerque, Albuquerque, NM, October 19, 1985.

(4) Household/Small Quantity Generator Hazardous Waste Collection Project Request for Proposal, Nubmer 85-1219-J, City of Albuquerque, Albuquerque, NM, April 5, 1985.

(5) Executive Order, Mayor Harry E. Kenney, Mayor, City of Albuquerque, NM, October 18, 1985.

(6) Personal Communiation, Donna Lacombe, Environmental Health and Energy Department, City of Albuquerque, Albuquerque, NM, October 29, 1986.

EXHIBIT 3. PARTICIPATION AND RESULTS, ALBUQUERQUE, NM

- Duration: 5 days (October 18-22, 1985)
- Locations: 1
- Participants
  - -- Households: 1,005 (including 7 call in for pick-up)
  - -- Schools: 9
  - -- Commercial small quantity generators: 57
- Household Participation Rate: 0.77% (1,005/130,000 households in area x 100)
- Waste Collected
  - -- Households: 46,215 lb.
  - -- Others : 72,285 lb.
  - -- Total : 118,500 lb.
  - -- Waste Oil : 750 gal. (approx 4,500 lb.)
- Waste per Participant
  - -- Households: 46 lb.
  - -- Others : 1,095 lb.
- Total Costs: $146,525
- Cost per Pound of Waste: $1.24 (total costs/total waste).

Source: Reference 6

EXHIBIT 4. COST SUMMARY, ALBUQUERQUE, NM

COSTS	
Hazardous waste contractor	$ 72,000
Salaries of City employees	48,000
Benefits for City employees (est) 20%	9,600
Administration and overhead (est)	1,000
Publicity	11,900
Subtotal	$142,500
DONATIONS	
Volunteer labor (90 hrs x $15/hr)	$ 1,350
Use of facility and forklift (est)	2,000
Donated labor (45 hrs x $15/hr)	675
Subtotal	$ 4,025
TOTAL COSTS	$146,525

Source: Reference 6

FAIRFAX COUNTY, VIRGINIA

INTRODUCTION

In 1983, the Fairfax County Board of Supervisors formed a Hazardous Materials Core Group to study the problem of household hazardous waste in the County. After researching the current household hazardous waste management alternatives, the concept of the "clean-up day" seemed to be the most effective. The Department of Public Works, Division of Wastewater Treatment was directed by the County Board of Supervisors, to coordinate a collection day that was scheduled for October 26, 1985.(1)

The goals of the "clean-up day" were to provide for the disposal of residential household hazardous waste, gather information on types and quantities of each waste from every participant to determine the feasibility of future projects, to divert the disposal of household hazardous waste from the municipal wastestream, and to increase public awareness of the environmental dangers of household hazardous waste.

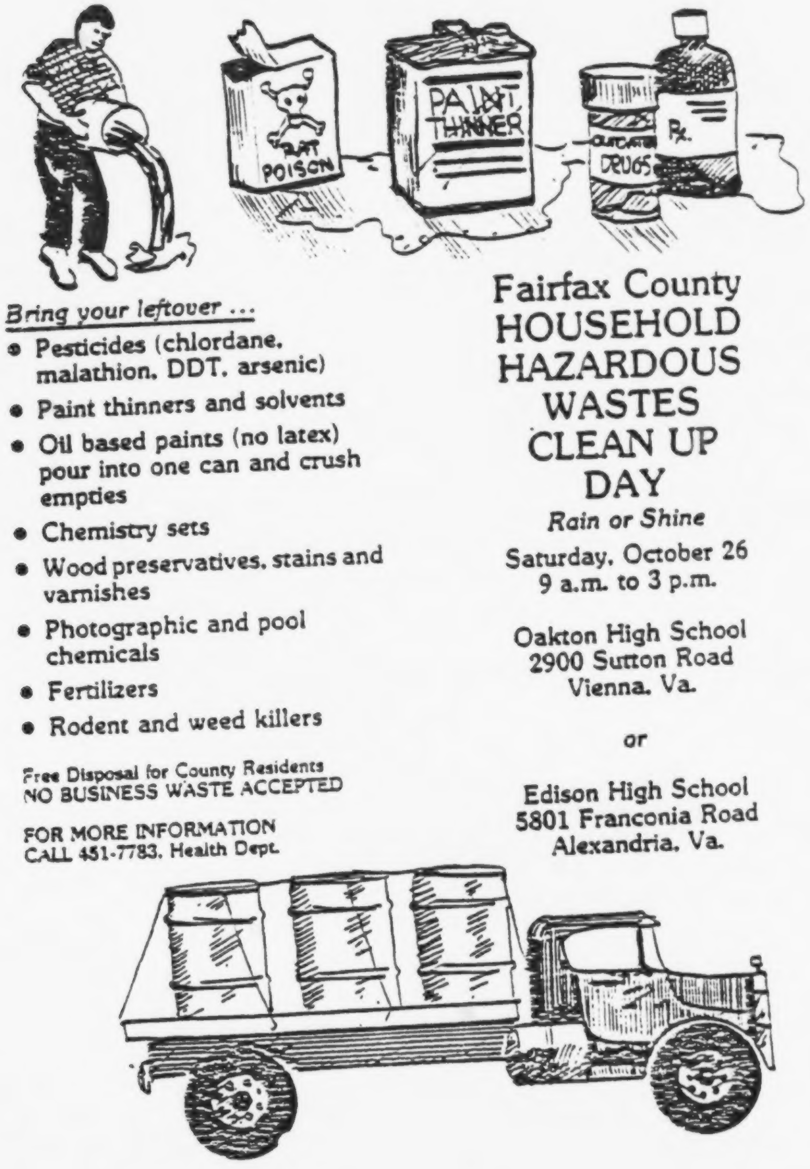
The County Board of Supervisors approved the implementation of a "Fairfax County Household Hazardous Waste Clean-Up Day" on September 16, 1985 (about six weeks prior to the event). GSX was selected as the hazardous waste contractor to collect and dispose of the household hazardous waste.(1) Criteria used in the evaluation for the selection of the contractor included the following:(2)

- The contractor must have had previous experience in household hazardous waste collection days.
- The contractor must take the responsiblity as a generator.
- The contractor must show the existence of a safety plan.

PUBLICITY

Publicity for the HHW collection day was managed by the Fairfax County Office of Public Affairs. The County made a valiant effort to publicize this event. Due to time contraints and missed deadlines, the advertising did not seem to reach a large part of Fairfax County. Eleven different groups were targeted to receive flyers and posters. These included libraries, government agencies, retail outlets, and schools. News releases were issued to the media on two different occasions prior to the collection day. A public service announcement was also released to the local cable television station. Additionally, an article appeared in the Fairfax County (Government's) Weekly Agenda. A number of community groups distributed flyers. Flyers and brochures were also distributed by County staff at local social events and farmers' markets throughout the area.(3) Examples of the flyer and brochure appear in Exhibit 1.

EXHIBIT 1. EXAMPLE OF FAIRFAX COUNTY, VIRGINIA FLYERS


RAT POISON
PAINT THINNER
OUTDATED DRUGS
Rx.

Bring your leftover ...

- Pesticides (chlordane, malathion, DDT, arsenic)
- Paint thinners and solvents
- Oil based paints (no latex) pour into one can and crush empties
- Chemistry sets
- Wood preservatives, stains and varnishes
- Photographic and pool chemicals
- Fertilizers
- Rodent and weed killers

Free Disposal for County Residents
NO BUSINESS WASTE ACCEPTED

FOR MORE INFORMATION
CALL 451-7783, Health Dept.

Fairfax County
HOUSEHOLD
HAZARDOUS
WASTES
CLEAN UP
DAY

Rain or Shine

Saturday, October 26
9 a.m. to 3 p.m.

Oakton High School
2900 Sutton Road
Vienna, Va.

or

Edison High School
5801 Franconia Road
Alexandria, Va.

THE PROBLEM

Your cleaning cabinet, workshop or garden shed probably contains potentially hazardous materials. They may be toxic, flammable, corrosive, explosive, or chemically active. They range from the familiar chemicals such as lead and mercury, through chemicals of vague familiarity such as cadmium, and on to the newer substances that have such complex names (such as "trichloroethylene") that they go by initials (TCE).

So—if you have a product that you want to throw away, where is "away"? If the substance is put:

onto the land, it is a possible danger to people and animals that come into contact with it.

into the land or surface water, it affects water recreation, water supplies, or groundwater.

down the drain and into sewers, it interferes with treatment of sewage and the beneficial reuse of sludge and effluent. Or into septic systems, where groundwater is affected.

out for the refuse workers, it is not only a danger to people, but it ends in a landfill. Toxic materials that have leached or are leaching from old dumps and landfills are a growing source of serious pollution. The Fairfax County landfills do not permit disposal of hazardous materials.

If a hazardous waste is given to a licensed and professional handler, it can be recycled for future reuse, neutralized, or properly contained, disposed or destroyed.

WHAT TO TAKE ON COLLECTION DAY?

Listed below are some common items you may have in your home. These items can be hazardous to the environment and your health if improperly disposed. Bring items such as these in their original container to the Clean-Up Day for FREE, PROPER DISPOSAL.

- Pesticides (including chlordane, malathion, DDT, arsenic)
- Weed and rodent killers
- Fertilizers
- Paint thinners and solvents
- Degreasers
- Swimming pool chemicals
- Wood preservatives, stains, varnishes
- Photographic chemicals
- Spot removers
- Chemistry kits
- Unused flammable liquids (gasoline, kerosene)
- Oil based paints (NO LATEX) pour into one can and crush empties.
- Battery fluids

If you have over 5 gallons of liquid or 75 pounds of solid wastes, please call 451-7783 in advance to make arrangements for disposal.

WHAT WILL NOT BE ACCEPTED

- **COMMERCIAL, INDUSTRIAL or MEDICAL WASTES** (including biologically active)
  For assistance with the type of waste contact the Va. Dept. of Health 1-800-552-2075.
- **RADIOACTIVES** (smoke detectors)
  Return to manufacturer
- **RADIOACTIVES** (all others)
  Call the Va. Dept. of Health 1-800-552-2075
- **NORMAL TRASH or SPECIAL PICKUP ITEMS** (tree limbs, refrigerators, furniture, other large items)
  Special pickup and disposal info call Fairfax County Division of Solid Waste 631-1484.
- **ASBESTOS**
  If properly packaged can be disposed of at the landfill. For instructions, call the Fairfax County Health Dept. at 461-7783.
- **USED MOTOR OIL**
  is currently recycled by many Fairfax County service stations. For info on the service stations nearest you that will accept used motor oil, call the Office of General Services at 691-2315 or call the Information Line at 691-INFO, ask for tape no. 346.
- **EXPLOSIVES**
  Contact the Fairfax County Police Dept.
- **OTHERS**
  —compressed gas cylinders
  —shock sensitive materials
  —drums
  —weapons

For further info call Fairfax County Health Dept. 461-7783

IF YOU WANT MORE
INFORMATION, CALL
Fairfax County Health Department
Mon.-Fri. 10 a.m. to 4 p.m. at 461-7783

Oakton High School

Edison High School

QUESTIONS & ANSWERS

- *Is there a charge for disposal of household hazardous waste on Clean-Up Day?*

  The County Board of Supervisors is allocating funds for the cost of this service, so there will be no charge to you.

- *Where does the material go after collection?*

  The contractor hired by the County will either neutralize, recycle, incinerate or dispose of the material safely. The contractor is licensed by the federal government to do this.

- *Will some materials be refused?*

  We have listed materials that will not be accepted. We also reserve the right to refuse some unidentified products.

- *What if the container is damaged?*

  Please package the container in a plastic garbage bag so it will not spill during your trip to the Clean-Up Day site.

PAINT THINNER

Fairfax County
HOUSEHOLD HAZARDOUS WASTE CLEAN UP DAY

Rain or Shine

DAY: Saturday, October 26, 1985
TIME: 9 a.m. to 3 p.m.
LOCATIONS: Oakton High School
2900 Sutton Road
Vienna, Va.

Edison High School
5801 Franconia Road
Alexandria, Va.

SITE LOCATION

In the original plan, three collection sites were selected, to be operated simultaneously. These were to be located in the southern, central and western parts of the County. The recommendation by the contractor and prohibitive costs, led to the selection of two sites, Edison High School in Springfield (southern area) and Oakton High School in Oakton (west-central area). (1)

OPERATIONS

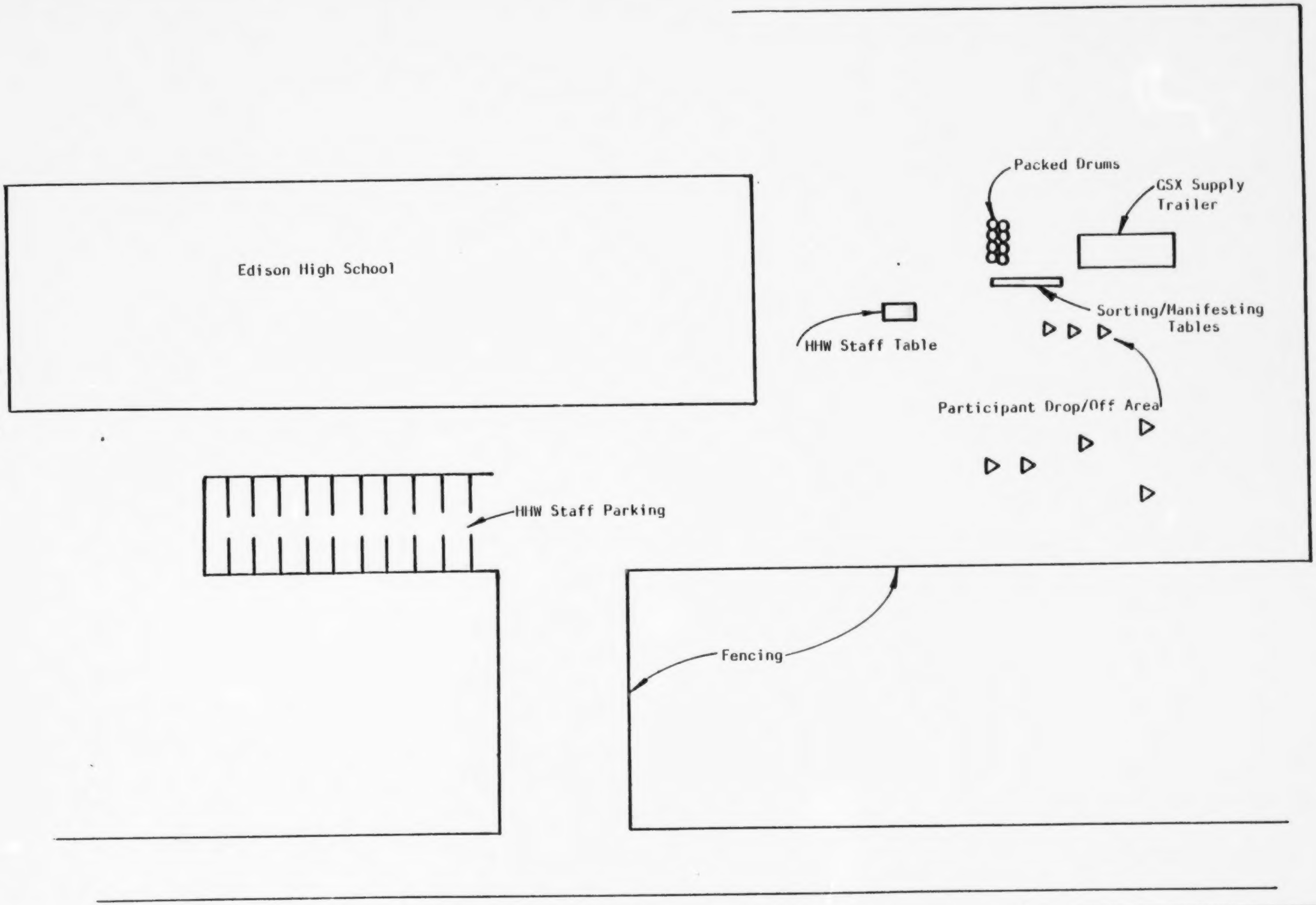
The collection site operations were similar at both sites. The participant entered the collection site and drove around a series of traffic cones to the disposal area. No traffic direction was evident at either site. This caused considerable confusion. Moreover, vehicles that were at the schools for other events drove to the disposal area. A diagram of the collection site appears in Exhibit 2. After arriving at the collection point, the participant was greeted by a County employee for an interview. The wastes were removed from the car by a County employee (in most instances) and moved to the processing area. GSX personnel then sorted, packed, and manifested the HHW for transportation and disposal. Fairfax County Police, Virginia Department of Emergency Services, and GSX staff were on-site in the event an incident occurred. Additionally, refuse staff were on-site to collect and dispose of any normal refuse brought to the site.

The types of waste accepted at this household hazardous waste collection day included: pesticides (including chlordane, malathion, DDT, arsenic); weed and rodent killers; fertilizers; paint thinners and solvents; degreasers; swimming pool chemicals; wood preservatives (including stains, varnishes); photographic chemicals; spot removers; chemistry sets; unused flammable liquids (gasoline, kerosene); oil-based paints; and batteries. Wastes excluded from the program (though accepted if brought to the site) included: biologically active wastes, radioactive wastes, normal refuse, asbestos, used motor oil, explosives, cylinders of compressed gas, shock-sensitive materials, dioxins, and kepones. Any unknown materials were screened by County personnel before being accepted. If the county did not accept the unknown material, GSX noted the incident in the daily log. Small quantity generators and businesses were also excluded from the HHW collection day. Any small quantity generator or small business that attempted to participate was rejected.

LIABILITY

Several forms of liability insurance were involved. Limited liability was accepted by the County of Fairfax. This included its employees and the physical collection site (land, buildings). As the generator, the contractor was liable for any incidents occuring during the sorting, packaging, transportation or disposal of the wastes. The Department of Emergency Services personnel were insured against liability by the Commonwealth of Virginia.

EXHIBIT 2. TYPICAL SITE PLAN, FAIRFAX COUNTY, VA


Packed Drums
GSX Supply Trailer
Edison High School
Sorting/Manifesting Tables
HHW Staff Table
Participant Drop/Off Area
HHW Staff Parking
Fencing

RESULTS AND COSTS

A total of 251 households particpated in the household hazardous waste collection day out of approximately 223,000 total households in the County. The greatest amount of wastes collected included oil-based paint and pesticides. Latex paints brought to the collection site, were disposed of in a refuse container and transported to the landfill. The same procedure was used for aerosal cans. Waste oil was taken to Fairfax County's vehicle maintenance yard for recycling.

Results of the on-site survey indicate that 60 percent of the participants would have continued to store the wastes if the HHW collection day had not occurred. Likewise, a majority (55 percent) said they would participate in an annual household hazardous waste collection day. A summary tabulation of the participant survey is shown in Exhibit 3.

Participation and quantities recovered are shown in Exhibit 4. The figures for the quantities recovered and the waste per participant were estimated due to the lack of data available when this case study was prepared. The estimate for the total weight of waste collected and the resultant weight per participant was based on three sources. This consists of a report by the Agency of Environmental Conservation on the methods and programs for HHW collection and disposal(4), the data from the Albuquerque HHW Collection Program, and on-site personal observations. Using this information, it was estimated that each household contributed approximately 31 pounds of HHW (including waste oil).

Cost for the one-day collection program is estimated at nearly $70,400. Many of the costs are estimates due to the lack of available data. The costs also include estimated values of volunteer labor, factors for fringe benefits for County and State employees and administration costs. A cost summary is shown in Exhibit 5. Cost per pound of HHW collected was estimated at $9.05.

FUTURE PLANS

The County is establishing a one-year pilot project consisting of a transfer and disposal site at the Lower Potomac Pollution Control Plant at Lorton, in the extreme southern portion of the County. The wastes will be collected and stored on-site and periodically transported to a permitted facility by a hazardous waste transporter.(1) The objective of this pilot project is to determine the cost-effectiveness and feasibility of a permanently operating facility. The County will also sponsor another HHW collection day in the spring. Funding has already been appropriated for the project, however details have not yet been made available.(1)

REFERENCES

(1) Personal Communication, Robin Byrd, Fairfax County Department of Public Works, Wastewater Treatment, October 26, 1985.

(2) Fairfax County Request for Proposal, No. 6-0125-20-27, Fairfax County, Department of Public Works, August 19, 1985.

(3) Memorandum to J. Hamilton Lambert - Fairfax County Executive from Jean Van Devanter, Office of Public Affairs, October 22, 1985.

(4) Methods and Programs for the Collection and Disposal of Household Quantities of Hazardous Waste, State of Vermont, Agency of Environmental Conservation, Montpelier, VT, January 10, 1985.

EXHIBIT 3. SUMMARY OF FAIRFAX COUNTY VIRGINIA PARTICIPANT SURVEY

Edison High School: 116 Participants   Oakton High School: 135 Participants

Total Number of Participants: 251

Type of Waste(s) and Amount Delivered:

Type of Waste	Number of Containers
Paint and Paint Related Products (Non-Latex Paint, Turpentine, Varsol, Paint Thinner)	779
Cleaners and Solvents	216
Petroleum Products (Asphalt, Tar, Petroleum Distillate)	65
Automotive and Fuel (Lighter Fluid, Kerosene, Oils That Were Mixed)	65
Chemicals and Flammables (Resins, Wood Preservatives, Xylol, Sealer)	151
Pesticides and Herbicides	682
Corrosives (Acids, Rust Remover)	228
Poisonous (Potassium Cyanate, Copper Sulfate, Sodium Thiosulfate, Boray)	194
Oxidizers (Potassium Dichromate, Strontium Ditrate, Nitric Acid)	24
TOTAL CONTAINERS	2,402*

Was this location convient? Yes: 82.3 percent   No: 17.6 percent

What would you have done with this waste if this clean-up day had not been held?

Included it with your household garbage: 15.1 percent
Continued to hold onto and store the wastes: 60.1 percent
Poured it down the sink or toilet: 0.3 percent
Poured it down the storm drain: 0.3 percent
Buried the material: 0.7 percent
Other: 23 percent (Most of which said they would call the County for disposal information.

EXHIBIT 3 (Continued)

How often would you use this clean-up day services?

Once a year: 55.6 percent
Twice a year: 25.4 percent
Four times a year: 4.0 percent
Never again: 2.4 percent
Other: 12.5 percent of the participants stated they would use this service once every other year.

How did you hear about the Household Hazardous Waste Collection Day?

School Brochure: 21.5 percent
Newspapers: 24.1 percent
Cable TV: 1.4 percent
Radio: 2.2 percent
Weekly Agenda: 13.0 percent
Flyers: 7.8 percent
Posters: 20.0 percent
Special Events ("Fairfax Day"): 1.4 percent
Word of Mouth: 2.6 percent
League of Women Voters: 3.3 percent
Employer: 0.3 percent
Homeowners Association: 1.8 percent

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* Source: Personal Communication, Robin Byrd, Department of Public Works Division of Waste Water Treatment, County of Fairfax, Fairfax Virginia, November 12, 1985.

EXHIBIT 4. PARTICIPATION AND RESULTS, FAIRFAX COUNTY, VA

- Duration: 1 day (October 26, 1985)
- Locations: 2
- Participants: 251 households
- Participation Rate: 0.11% (251/223,000 households in County x 100)
- Weight of Waste Collected
  - -- Households: 6,777 pounds*
  - -- Waste Oil: 1,004 pounds**
- Waste per Participant
  - -- Household: Approximately 27 pounds*
  - -- Waste Oil: 4 pounds**
- Total Costs: $70,400 (estimated)
- Cost per Pound of Waste (including oil): $9.05

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* Estimate based on the Connecticut/Vermont HHW Collection Day Summary Report and On-Site Personal Observations.

** Estimate Based on Albuquerque, NM HHW Collection Program Data.

EXHIBIT 5. COST SUMMARY FAIRFAX COUNTY, VIRGINIA

COSTS		
Salaries - County Employees (Planning)		
1 Project Manager	140 hrs @ $15/hour (est)	$ 2,100
11 Staff Members	80 hrs @ $13/hour (est)	11,440
Salaries - Project Staff (on-site)		
2 County Representatives	8 hrs @ $15/hour (est)	240
6 Technicians	8 hrs @ $13/hour (est)	624
2 Policemen	8 hrs @ $11/hour (est)	176
2 Firemen	8 hrs @ $11/hour (est)	176
2 Refuse Workers	8 hrs @ $8/hour (est)	128
3 State Health Employees	8 hrs @ $12/hour (est)	288
	Subtotal Salaries:	**$ 15,172**
Benefits for County Employees	22.5 % of salaries:	3,414
Overhead/Administration	(Est. 20% of salaries):	3,034
Transportation		
Flyer Distribution	200 mi @ $.20/mi (est)	40
Travel to Collection Site		30
Printing/Duplication		
10,360 Brochures		3,200
187,000 Flyers		
686 Posters		
Contractor Expenses (2 Crews of 3 Men and 2 Trucks)		
Vermiculite		45,000
Drums		
Salaries		
Per Diem ($50/person/day)		
Transportation		
Disposal		

EXHIBIT 5 (Continued)

Donated Services (est)	
Brochure and Flyer Distribution	
League of Women Voters	
School Board (through interoffice mail to all schools)	
Libraries (through interoffice mail to all libraries)	
Fire Station (through interoffice mail to all fire stations	500
Estimated Total Costs:	**$ 70,390**

Sources: Robin Byrd, HHW Project Manager, Department of Public Works, Waste Water Treatment Division, Fairfax County, Virginia

Fairfax County Fire Department, Fairfax County, Virginia

Fairfax County Police Department, Fairfax County, Virginia

Office of Personnel, Classification Division, Fairfax, County, VA

STATE OF FLORIDA

In 1983, the Florida Legislature passed the Water Quality Assurance Act to protect Florida's ground water from further contamination. A provision of this act mandated that the Department of Environmental Regulation conduct a hazardous waste collection program entitled Amnesty Days. The program required two collection periods per year for three years. Each collection period is from one to six weeks in length. A collection effort is to be conducted at least once in each county in those three years. The goals of the project are to collect the greatest amount of waste from schools, small quantity generators, government agencies, farmers, and households; to educate the public to make them aware of what is and what is not a hazardous waste; and to determine the need and feasibility of facilities for storage or disposal of waste in the State.(1)

The Amnesty Day program is funded by the Water Quality Assurance Trust Fund which is part of the Coastal Protection Trust Fund.(2) The project is funded on an annual basis. Ceilings on administrative and publicity costs are each set at 5 percent of the program funds. The remainder is used for the actual collection and disposal costs.

The State is responsible for total program coordination and administration. This includes locating a collection site, setting up collection dates, contracting a hazardous waste management firm, publicity, and providing on-site personnel to coordinate activities at the collection station.(3) The State also maintains a toll-free telephone number for citizens and businesses to use for any questions reqarding hazardous waste storage and disposal or Amnesty Days.(5)

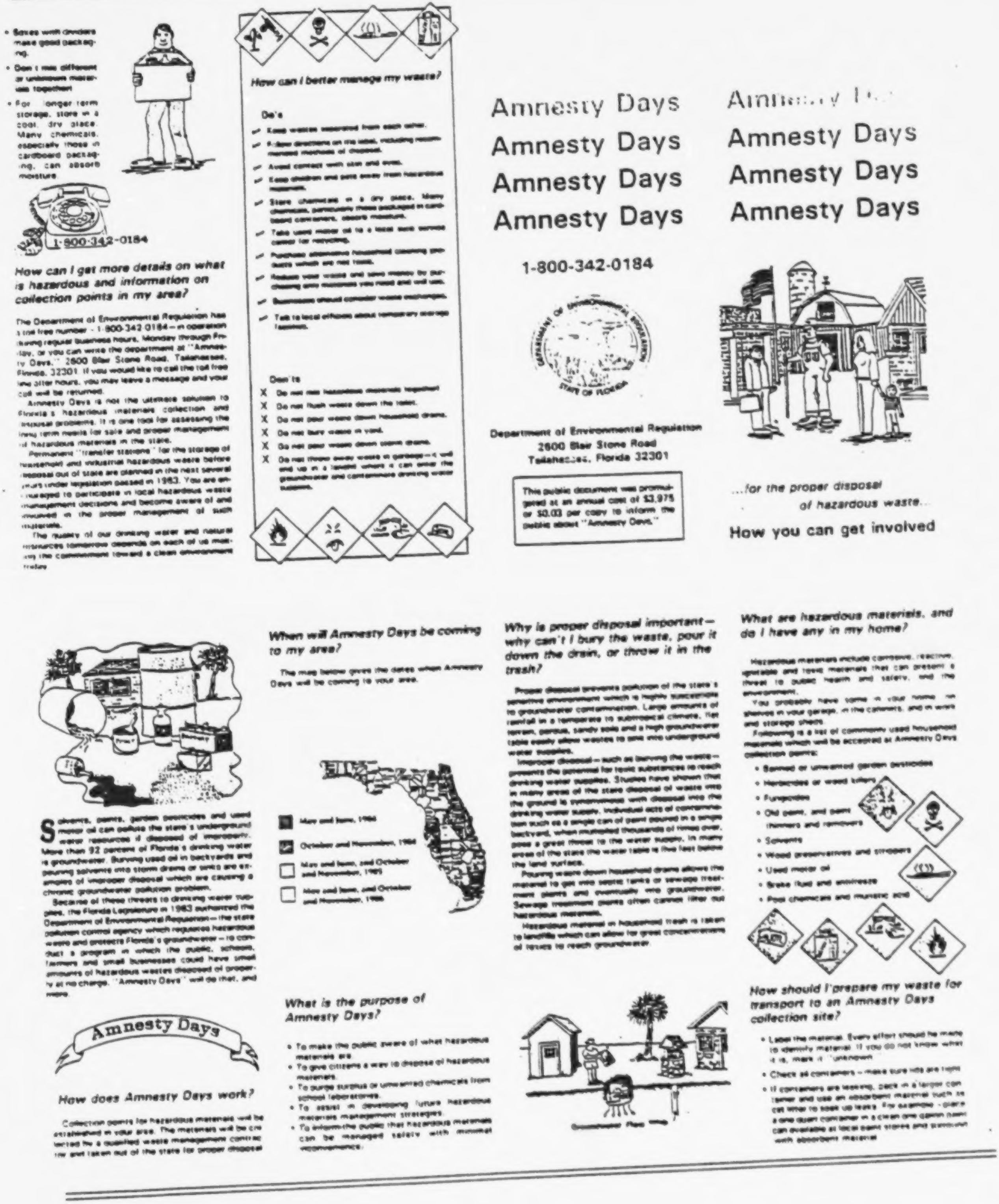
PUBLICITY

Publicity is funded by the State. A five-fold approach has been taken towards educating the public on the Amensty Day program(1):

- Television and radio public service announcements
- Pamphlets targeted at specific groups or organizations
- Films shown on local cable TV stations
- Newspaper advertisements
- Electric and water bill inserts

In addition civic groups and professional organizations include Amnesty Day information in their newsletters. The State also enlists the help of such groups as the League of Women Voters to distribute pamphlets and disseminate information.(3) A sample of some of the publicity materials is shown in Exhibit 1.

EXHIBIT 1. EXAMPLE PUBLICITY MATERIALS, STATE OF FLORIDA



- Boxes with dividers make good packaging.
- Don't mix different or unknown materials together.
- For longer term storage, store in a cool, dry place. Many chemicals, especially those in cardboard packaging, can absorb moisture.

1-800-342-0184

How can I get more details on what is hazardous and information on collection points in my area?

The Department of Environmental Regulation has a toll free number - 1-800-342-0184 - in operation during regular business hours, Monday through Friday, or you can write the department at "Amnesty Days," 2600 Blair Stone Road, Tallahassee, Florida, 32301. If you would like to call the toll free line after hours, you may leave a message and your call will be returned.

Amnesty Days is not the ultimate solution to Florida's hazardous materials collection and disposal problems. It is one tool for assessing the long term needs for safe and proper management of hazardous materials in the state.

Permanent "transfer stations" for the storage of household and industrial hazardous waste before disposal out of state are planned in the next several years under legislation passed in 1983. You are encouraged to participate in local hazardous waste management decisions and become aware of and involved in the proper management of such materials.

The quality of our drinking water and natural resources tomorrow depends on each of us making the commitment toward a clean environment today.

How can I better manage my waste?

Do's

- ✓ Keep wastes separated from each other.
- ✓ Follow directions on the label, including recommended methods of disposal.
- ✓ Avoid contact with skin and eyes.
- ✓ Keep children and pets away from hazardous materials.
- ✓ Store chemicals in a dry place. Many chemicals, particularly those packaged in cardboard containers, absorb moisture.
- ✓ Take used motor oil to a local auto service center for recycling.
- ✓ Purchase alternative household cleaning products which are not toxic.
- ✓ Reduce your waste and save money by purchasing only materials you need and will use.
- ✓ Businesses should consider waste exchanges.
- ✓ Talk to local officials about temporary storage facilities.

Don'ts

- X Do not mix hazardous materials together.
- X Do not flush waste down the toilet.
- X Do not pour waste down household drains.
- X Do not bury waste in yard.
- X Do not pour waste down storm drains.
- X Do not throw away waste in garbage—it will end up in a landfill where it can enter the groundwater and contaminate drinking water supplies.

Amnesty Days
Amnesty Days
Amnesty Days
Amnesty Days

1-800-342-0184

Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

This public document was promulgated at an annual cost of $3,975 or $0.03 per copy to inform the public about "Amnesty Days."

Amnesty Days
Amnesty Days
Amnesty Days
Amnesty Days

...for the proper disposal
of hazardous waste...

How you can get involved

Solvents, paints, garden pesticides and used motor oil can pollute the state's underground water resources if disposed of improperly. More than 92 percent of Florida's drinking water is groundwater. Burying used oil in backyards and pouring solvents into storm drains or sinks are examples of improper disposal which are causing a chronic groundwater pollution problem.

Because of these threats to drinking water supplies, the Florida Legislature in 1983 authorized the Department of Environmental Regulation—the state pollution control agency which regulates hazardous waste and protects Florida's groundwater—to conduct a program in which the public, schools, farmers and small businesses could have small amounts of hazardous wastes disposed of properly at no charge. "Amnesty Days" will do that, and more.

Amnesty Days

How does Amnesty Days work?

Collection points for hazardous materials will be established in your area. The materials will be collected by a qualified waste management contractor and taken out of the state for proper disposal

When will Amnesty Days be coming to my area?

The map below gives the dates when Amnesty Days will be coming to your area.

- ▨ May and June, 1984
- ▨ October and November, 1984
- ☐ May and June, and October and November, 1985
- ☐ May and June, and October and November, 1986

What is the purpose of Amnesty Days?

- To make the public aware of what hazardous materials are.
- To give citizens a way to dispose of hazardous materials.
- To purge surplus or unwanted chemicals from school laboratories.
- To assist in developing future hazardous materials management strategies.
- To inform the public that hazardous materials can be managed safely with minimal inconvenience.

Why is proper disposal important—why can't I bury the waste, pour it down the drain, or throw it in the trash?

Proper disposal prevents pollution of the state's sensitive environment which is highly susceptible to groundwater contamination. Large amounts of rainfall in a temperate to subtropical climate, flat terrain, porous, sandy soils and a high groundwater table easily allow wastes to sink into underground water supplies.

Improper disposal—such as burying the waste—presents the potential for toxic substances to reach drinking water supplies. Studies have shown that in many areas of the state disposal of waste into the ground is synonymous with disposal into the drinking water supply. Individual acts of contamination such as a single can of paint poured in a single backyard, when multiplied thousands of times over, pose a great threat to the water supply. In many areas of the state the water table is five feet below the land surface.

Pouring waste down household drains allows the material to get into septic tanks or sewage treatment plants and eventually into groundwater. Sewage treatment plants often cannot filter out hazardous materials.

Hazardous material in household trash is taken to landfills which can allow for great concentrations of toxics to reach groundwater.

What are hazardous materials, and do I have any in my home?

Hazardous materials include corrosive, reactive, ignitable and toxic materials that can present a threat to public health and safety, and the environment.

You probably have some in your home: on shelves in your garage, in the cabinets, and in work and storage sheds.

Following is a list of commonly used household materials which will be accepted at Amnesty Days collection points:

- Banned or unwanted garden pesticides
- Herbicides or weed killers
- Fungicides
- Old paint, and paint thinners and removers
- Solvents
- Wood preservatives and strippers
- Used motor oil
- Brake fluid and antifreeze
- Pool chemicals and muriatic acid

How should I prepare my waste for transport to an Amnesty Days collection site?

- Label the material. Every effort should be made to identify material. If you do not know what it is, mark it "unknown."
- Check all containers – make sure lids are tight.
- If containers are leaking, pack in a larger container and use an absorbent material such as cat litter to soak up leaks. For example - place a one quart container in a clean one gallon paint can available at local paint stores and surround with absorbent material.

EXHIBIT 1 (Continued)

How To Participate

You may register for the Amnesty Days Cooperative Services Program by calling the special toll-free telephone number established for "Amnesty Days". (See the toll-free number below). The information operator will register your name, address and telephone number, and you will be contacted to schedule your service or, you may wish to register at the "Amnesty Days" Collection Station. Remember, the Collection Station will provide FREE disposal for up to 55 gallons or 450 pounds of combined waste per participant, but if you have more than this quantity, you will need to use the Amnesty Days Cooperative Services Program.

Additional Information
1-800-342-0184

Information & Collection Station Location

Amnesty Days
1-800-342-0184

Amnesty Days
Amnesty Days
Amnesty Days

COOPERATIVE SERVICES PROGRAM

Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

. . . for the proper disposal of hazardous waste

What is "Amnesty Days Cooperative Services"?

The Amnesty Days Cooperative Services Program is designed in conjunction with "Amnesty Days" to provide for the proper handling and disposal of hazardous materials which exceed the limit under the original "Amnesty Days" program.

Under Section 403.7241 of the Florida Statutes, "Amnesty Days" is made available to dispose of small quantities of hazardous waste — free of charge — for homeowners, farmers, schools, state agencies, and small businesses.

The Amnesty Days Cooperative Services Program provides not only active disposal of hazardous waste, but any information regarding the "what's", "where's", and "why's" of hazardous waste disposal. Our objective is, that with proper information and guidance, you can gain confidence and understanding in dealing effectively with hazardous waste management and disposal.

Services Provided

The Florida contractor for "Amnesty Days" is Triangle Resource Industries (TRI), a division of SCA Chemical Services, Inc. (SCA). SCA will offer special reduced prices for all services to participants for the duration of "Amnesty Days". A schedule of dates and locations for your area is shown on the back of this brochure.

SCA and TRI are full-service hazardous waste management operations who specialize in serving small generators, schools, and research facilities. This specialization helps us to better understand your needs in hazardous waste disposal.

An SCA Program representative will contact you with an easy-to-use information service packet describing all available services and their costs. We will assist in evaluating any special needs. Some areas in which you may need help include lab analysis, manifesting, training, shipping containers, packaging supplies and labels, licensing support, health and safety, and emergency-spill back-up.

Participant Fee Schedule

As a result of SCA's "Amnesty Days" involvement, we are offering a minimum 25% reduction in normal charges for personnel services, transportation, disposal, containers, and supplies. To help forecast your costs, use the following charts: (A full fee schedule will be provided in the service packet.)

Waste Disposal & Transportation

Waste Type (55-gal. dr.)	Standard Fee	Amnesty Fee
liquids*	$135.00	$99.00
solids*	$135.00	$99.00
lab-packs*	$135.00	$99.00
PCB-liq.	$8.45/gal	$6.34/gal
reactives	$44.50/lb	$33.00/lb

*excluding gases, aerosols, radioactives, reactives, PCB's

Materials and Supplies

Item	Standard Fee	Amnesty Fee
55-gal steel drums	$28.00	$21.00
55-gal poly drums	$38.00	$28.50
55-gal non-corrosive solidification drums	$44.50	$33.25
55-gal corrosive solidification drums	$49.50	$37.00
overpacks	$125.00	$93.75
vermiculite	$7.50/bg	$5.60/bg
drum liners	$1.50/ea.	$1.10/ea.

Labor and Personnel

Title	Standard Fee	Amnesty Fee
Supervisor	$45.00/hr.	$30.00/hr.
Explosives Technician	$40.00/hr.	$27.00/hr.
Industrial Hygienist	$40.00/hr.	$27.00/hr.
Field Chemist	$35.00/hr.	$25.00/hr.
Technician	$25.00/hr.	$18.00/hr.

CONTRACTOR SELECTION

A request for a proposal was issued by the Department of Regulation (DER) on January 13, 1984.(4) The award was based on eight criteria:

- Safety plan
- Technical approach and record keeping
- Project organization and management
- Experience
- Personnel assigned and level of effort
- Schedule implementation and estimated level of participation
- Ability to maintain a professional image
- Price

Each of the selection factors were assigned a value ranging from 0 to 15 depending upon the relative importance of the factor. The State then rated each factor in each of the submitted proposals the contract was awarded with the highest numerical score.(4)

CONTRACTOR'S RESPONSIBILITIES

The Contractor was responsible for supplying the personnel, materials, service, and facilities to accomplish the tasks. This included collecting, packaging, transporting, and disposing of the hazardous waste. The Contractor was also responsible for handling a separate accounting of all records and fees of those businesses and government agencies that disposed of quantities of hazardous waste above the designated limit. The Contractor was to be bonded or insured to guarantee responsibility for any liability that may incur in the collection, packaging, transport or disposal of the hazardous waste.(4)

SITE LOCATION

Florida is divided into several Regional Planning Councils. Each is a group of counties with similar long-term planning interests. The statute that established Amnesty Days set the dates for collection programs in each council. State-level program personnel then select a good location in each council.(3)

The location chosen for a collection site must be situated on a flat, well drained paved area. This facilitates easy and rapid clean-up of any spill that might occur. The sight must also be centrally located, easily accessible and its name must be well-recognized. If possible, it should be publicly-owned property. Collection sites have included courthouses, county health departments, city warehouses, airports and libraries.(3)

OPERATIONS

The State operates two types of mobile collection facilities. Based on population and geographic area, the State may operate one or both types of facilities within a Regional Planning Council. The larger of the two facilities, the main site, consists of the following:

- Two semi-trailers separated by a canopy that covers a laboratory and storage space.
- Eight chemists and/or industrial hygienists
- One explosives technician
- One Department of Environmenatal Regulation (DER) representative

The satellite site is smaller and consists of one semi-trailer with a canopy, six chemists and one DER representive. A general site plan is shown in Exhibit 2.(5)

The two facilities operate simultaneously. They may be in the same county within a Regional Planning Council (if substantiated by population) or in two different counties. Each facility remains at a collection site for 1 to 6 days depending on the geographic area to be served and the expected participation rate.

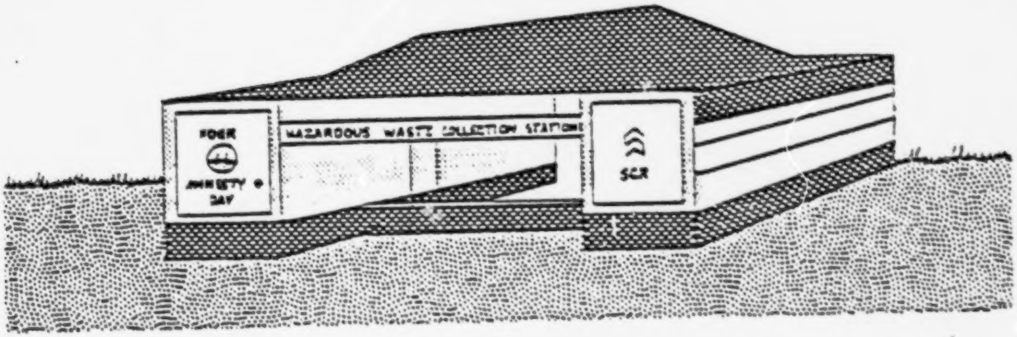
At the collection site, the participant is directed to a receiving area. The participant is interviewed to gather general information concerning disposal habits, type of organization, if the participant would support a permanent program, and their source of water (e.g., well or public system). There is also an industrial hygienist on-site to answer any inquiries. The participant is then routed to the collection area and transfers the waste to the Contractor. The Contractor sorts, packages, manifests and tests any uknown wastes in the mini-lab van. Methods to process explosives and reactives, even though they are listed as unacceptable, are present. An on-site explosives technician arranges for this disposal of the material. Other wastes not accepted include those that are biologically active, gas cylinders, and aerosol cans.(3)

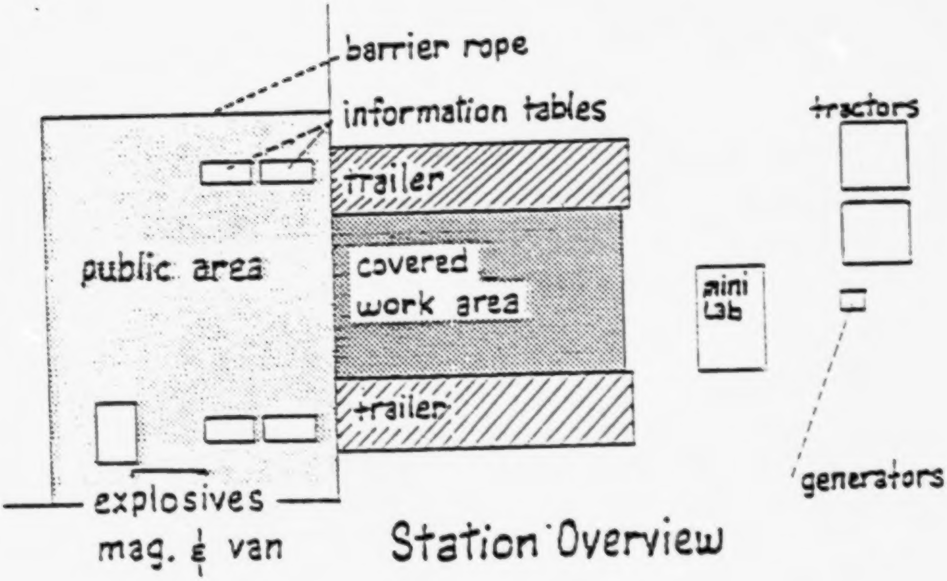
The Amnesty Days progam allows a participant to dispose of one barrel or 450 pounds of hazardous waste. If that amount is exceeded, the contractor offers a discounted fee of 25 percent off the regular disposal fee.(6)

After sorting, the wastes are routed to a packaging area separate from the collection area. There the waste are categorized according to hazard class, labeled, and manifested. The wastes are then moved to a storage area. The wastes are transported to the Contractor's fixed transfer and storage facility to be categorized and shipped to an appropriate, permitted treatment or disposal facility.

EXHIBIT 2. TYPICAL COLLECTION SITE, STATE OF FLORIDA

MOBILE ALL-WEATHER COLLECTION STATION USED
IN THE FLORIDA COLLECTION PROGRAM CALLED "AMNESTY DAYS"


FDER
AMNESTY DAY
HAZARDOUS WASTE COLLECTION STATION
SCR


barrier rope
information tables
tractors
trailer
public area
covered work area
mini lab
trailer
generators
explosives mag. & van

Station Overview

COSTS AND RESULTS

The Amnesty Days progam is funded on an annual basis in July from a grant from the Florida Legislature. The program requires two collection periods per year for three years. A collection period is from 4 to 6 weeks. There is one collection period in the fall (October - November) and one in the spring (May-June.(3) Of the total funds 5 percent has been mandated for administrative costs and 5 percent for publicity costs. The remaining funds are used for the actual collection, transportation, and disposal of the hazardous waste. The costs for each collection period vary considerably. Factors that cause this variaton include geographical locality, population size of the county served, and the number of units operating. Also, the State does not have a policy that excludes other Regional Councils from participating at a collecton site.(7) Exhibit 3 is a cost overview for each of the four collection periods that the State has operated thus far.

Costs are calculated on a daily basis for each collection center. If a county has two collection sites operating simultaneously, the costs are calculated individually for each site. The Contractor's costs are classified into three categories. These are operating expenses (salaries, lodging, food) materials and transportation costs. The cost for the DER representative is included in the initial 5 percent allocation for administrative costs.(7) Included in Exhibit 4 are the daily costs, by category, for three counties: Palm Beach County, Lee County, and Highlands County. These counties were chosen to illustrate the differences in operating costs for three different types of operations and populations.

Palm Beach County has a population of 576,863 with 234,339 households.(8) The State operated both the main and satellite sites in the county. The main site operated for 4 days in each of the two locations and the satellite site operated at one location for 4 days. The total cost for this project was $179,184 or $22,398 per day. In Lee County, with the population of over 205,266 (82,509 households), the State operated the main site for a period of 5 days. The total costs for this type of operation was $83,693 or $16,739 per day. Highlands County has a population of 47,526 (18,960 households). A single satellite site was operated at one location for 4 days. The total costs for this project was $17,895 or $4,474 per day.

No data is currently available relating the quantities of waste collected in any one county to costs. Thus, collection costs per pound of HHW cannot be directly calculated. Exhibit 5 is a tabulation of data on 28 of the 43 counties where collection programs have been conducted. Total cost for these 43 counties is the sum of the funding amounts shown in Exhibit 3 ($2.4 million). Assuming that the remaining 15 counties generated a proportional amount of HHW, a total of 937,000 lbs or 469 tons of waste were collected. This results in a cost of some $2.56 per pound.

Exhibit 5 illustrates the Amnesty Day collection totals for May 1984 through June 1985. Included in this exhibit are the participation rates in percents for each of the counties where a collection took place. The participation rates range from 0.07 percent in Dade County to 1.8 percent in Alachua County. However, the overall participation rate of 0.31 percent corresponds with the national participation averages of less than 1 percent of the population.

REFERENCES

1. The Florida Department of Governmental Regulation Presents Amnesty Days, Bureau of Operations, Florida Department of Evironmental Regulation.

2. Household Hazardous Waste, Solving the Disposal Dilemma, Golden Empire Health Planning Center, Sacramento, CA, 1984.

3. Personal Communication, Jan Kleman, Amnesty Days Program Coordinator, Florida Department of Environmental Regulation, November 1, 1985.

4. Request for Proposal, Solicitation No. 8047, Florida Department of Environmental Regulation, January 13, 1984.

5. "Amnesty Days - How You Can Get Involved", Florida Department of Environmental Regulations, 1984.

6. "Amnesty Days Cooperative Service Program, Florida Department of Envionmental Regulation, 1984.

7. Donna Clark, Amnesty Days Information Specialist, Florida Department of Environmental Regulation, January 15, 1986.

8. County and City Data Book, 1983, U.S. Department of the Census, U.S. Government Printing Office, 1983.

EXHIBIT 3. COLLECTION PERIOD COSTS

Collection Period	Dates Covered	Funding Approved	Funding Amount	Geographical Area Collected
1	May-June 1984	July 1983	$600,000	7 Counties
2	October-November 1984	July 1984	$800,000	14 Counties
3	May-June 1985	Date Not Available	$200,000	7 Counties
4	October-November 1985	July 1985	$800,000	15 Counties

Source:

Personal Communications, Jan Kleman, Florida Department of Environmental Regulation, November 1, 1985.

Personal Communication, Donna Clark, Florida Department of Environmental Regulation, January 15, 1986.

EXHIBIT 4. DAILY OPERATIONS COSTS FOR FLORIDA COLLECTION SITES

COUNTY	TYPE OF FACILITY	LOCATION/DAY	OPERATING EXPENSES (Salaries, Lodging, Food)	MATERIALS	TRANSPORTATION	TOTAL
Palm Beach (232,339 Households)	Main	A/Day 1	$ 4,860	$ 2,755	$ 12,172	$19,787
		A/Day 2	4,860	2,625	16,899	24,384
		A/Day 3	4,860	2,867	20,592	28,319
		A/Day 4	4,860	3,036	18,612	26,508
					Subtotal	98,993
	Main	B/Day 1	4,860	1,374	7,163	13,397
		B/Day 2	4,860	1,094	6,989	12,943
		B/Day 3	4,860	1,014	5,598	11,472
		B/Day 4	4,860	1,891	11,188	17,939
					Subtotal	$55,751
	Satellite	C/Day 1	3,240	857	4,915	9,012
		C/Day 2	3,240	399	2,303	5,942
		C/Day 3	3,240	322	1,384	4,946
		C/Day 4	3,240	233	1,067	4,540
					Subtotal	$24,440
Total For Palm Beach County						$179,184

EXHIBIT 4. (Continued)

COUNTY	TYPE OF FACILITY	LOCATION/DAY	OPERATING EXPENSES	MATERIALS	TRANSPORTATION	TOTAL
Lee County (82,509 Households)	Main	A/Day 1	$ 4,860	$ 1,668	$ 7,464	$ 14,022
		A/Day 2	4,860	1,784	10,231	16,875
		A/Day 3	4,860	1,814	7,900	14,574
		A/Day 4	4,860	1,580	9,419	15,859
		A/Day 5	4,860	2,725	14,808	22,393
Total for Lee County						$ 83,723
Highlands County (18,960 Households)	Satellite	A/Day 1	$ 3,240	$ 443	$ 1,946	$ 5,629
		A/Day 2	3,240	544	2,241	6,025
		A/Day 3	3,240	684	3,192	7,116
		A/Day 4	3,240	411	1,493	5,144
Total For Highlands County						$ 23,914

EXHIBIT 5. "AMNESTY DAY" COLLECTION TOTALS (MAY 1984 - JUNE 1985)

County	Number of Participants	Amount of Waste Collected (pounds)	Population (x 1000)	Households (x 1000)	Participation Rate %
Escambia County	109	33,195	233.8	81.1	0.13
Okaloosa County	201	29,419	109.9	37.5	0.50
Santa Rosa County	20	9,450	56.0	18.6	0.10
Walton County	23	4,145	21.3	8.0	0.29
Bay County	130	18,885	97.7	34.8	0.30
Holmes County	11	3,380	14.7	5.2	0.21
Washington County	14	3,030	14.5	5.2	0.27
Brevard County	454	33,110	273.0	101.8	0.44
Orange County	673	63,588	471.0	170.8	0.39
Osceola County	143	9,679	49.3	18.6	0.77
Lake County	172	16,160	104.9	41.7	0.41
Seminole County	162	13,179	179.8	63.2	0.26
Volusia County	192	17,785	258.8	105.8	0.18
Putman County	46	6,620	50.5	18.4	0.25
St. Johns County	52	8,184	51.3	18.6	0.28
Flagler County	22	1,377	10.9	4.4	0.50
Baker County	11	658	15.3	4.2	0.26
Duval County	383	81,249	571.0	208.4	0.18
Clay County	151	17,979	67.1	21.6	0.70
Nassau County	54	9,557	32.9	11.0	0.49
Alachua County	982	91,640	151.3	54.6	1.8
Dade County	439	54,982	1,625.8	609.8	0.07
Broward County	629	56,748	1,018.2	417.5	0.15
Monroe County	37	2,604	63.2	26.3	0.14
Manatee County	334	17,282	148.4	62.0	0.54
Hillsborough County	293	35,744	647.0	237.9	0.12
Pinellas County	1100	55,480	728.5	319.5	0.34
Pasco County	230	6,340	193.6	81.3	0.28
Totals	7,067	609,809	7,108.4	2,733.2	0.31

References:
- Amnesty Day Collection Totals, Florida Department of Environmental Regulations, Tallahasee, Florida, 1985.
- County and City Data Book, 1983, U.S. Department of the Census, U.S. Government Printing Office, 1983.

corresponds with the national participation averages of less than 1 percent of the population.

REFERENCES

1. The Florida Department of Governmental Regulation Presents Amnesty Days, Bureau of Operations, Florida Department of Evironmental Regulation.
2. Household Hazardous Waste, Solving the Disposal Dilemma, Golden Empire Health Planning Center, Sacramento, CA, 1984.
3. Personal Communication, Jan Kleman, Amnesty Days Program Coordinator, Florida Department of Environmental Regulation, November 1, 1985.
4. Request for Proposal, Solicitation No. 8047, Florida Department of Environmental Regulation, January 13, 1984.
5. "Amnesty Days - How You Can Get Involved", Florida Department of Environmental Regulations, 1984.
6. "Amnesty Days Cooperative Service Program, Florida Department of Envionmental Regulation, 1984.
7. Donna Clark, Amnesty Days Information Specialist, Florida Department of Environmental Regulation, January 15, 1986.
8. City and County Data Book, 1984.

APPENDIX E
MEMORANDA AND LETTERS RELATED TO LIABILITY OF COLLECTION PROGRAMS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JAN 28 1986

SUBJECT: CERCLA and RCRA Liability of Municipal Sponsors of Household Hazardous Waste Collection Programs

FROM: John P. Lehman, Director Alan S Corson for
Waste Management and Economics Division (WH-565)

TO: Basil G. Constantelos, Director
Waste Management Division
Region V

I am responding to your October 29, 1985, memorandum requesting an Agency policy statement concerning the liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of municipal sponsors of household hazardous waste collection programs. In addition, this memorandum clarifies the issue of potential liability under the Resource Conservation and Recovery Act (RCRA). The following interpretations are based on discussions of these issues with the Office of General Counsel (OGC) and the Office of Enforcement and Compliance Monitoring (OECM).

In a June 7, 1984, memorandum to the Deputy Administrator, Lee Thomas (then Assistant Administrator for the Office of Solid Waste and Emergency Response) clarified the issue of RCRA liability. This memorandum, which is attached, stated that household hazardous wastes are by definition exempt from regulation under Subtitle C of RCRA. Section 261.4(b)(1) unconditionally exempts household wastes from being designated as hazardous even when accumulated in quantities that would otherwise be regulated or when transported, stored, treated, disposed, recovered, or reused. However, when household wastes are mixed with hazardous wastes from small quantity generators, this resulting mixture is subject to the small quantity generator rules (Section 261.5). In addition, when household waste is mixed with other regulated hazardous wastes, the entire mixture becomes subject to full hazardous waste regulation (Section 261.3(a)(2)). For this reason, sponsors of household hazardous waste collection programs should be careful to limit the participation in their programs to households to avoid the possibility of receiving regulated hazardous wastes from commercial or industrial sources.

With regard to CERCLA, we cannot offer relief from long-term liability. CERCLA does not contain any type of exclusion for household waste or any type of exclusion based on the amount of waste generated. As a general matter, any waste that qualifies as a hazardous substance under CERCLA is subject to the liability provisions of Section 107. Hazardous substances are both defined under Section 101(14) and designated under Section 102(a). Therefore, if a household waste contains a substance that is covered under either section (whether or not it is a RCRA hazardous waste), potential CERCLA liability would apply regardless of whether the material was picked up as part of a community's routine trash collection service or was gathered as part of a special collection day program. With respect to household hazardous waste, such waste would clearly qualify as a "hazardous substance" if it contains any substance listed in Table 302.4 of 40 CFR Part 302.

With regard to enforcement under CERCLA, you noted that John Skinner, former Director of this office, recently cited a policy statement in a May 4, 1984, letter (attached) from Region I Administrator, Michael DeLand, to Dana Duxbury of the Massachusetts League of Women Voters. This policy statement relied on enforcement discretion in indicating that EPA had no intention of taking enforcement action against a Massachusetts town that sponsored a contracted collection day, if problems arose in the transportation or disposal of the household hazardous waste collected during the collection program. Further clarification was offered by Courtney Price (OECM) in a memorandum dated May 11, 1984 (attached), to Alvin Alm, former Deputy Administrator. For the specific case of that Masssachusetts town, the company collecting and transporting the wastes and the disposal facility owner or operator would be considered the responsible parties.

While you are correct in stating that the Agency's general policy is to not give "no action" assurances in enforcement matters (see attached Courtney Price memorandum of November 16, 1984), Ms. Price addressed a specific household hazardous waste collection program in the May 11, 1984, memorandum and explained their position in the Region I case in Massachusetts. The decision of "no action" in the Massachusetts case was based on the facts about that specific program. An important feature was limiting collections to household hazardous wastes. No wastes from small commercial businesses were accepted. Courtney Price indicated that OECM would have to look at the specific facts of any situation involving wastes from small businesses to determine whether an exercise of enforcement discretion would be appropriate.

In our recent discussions with OECM, we have considered the concept of "no action" as a possible general policy for sponsors of household hazardous waste collection programs. OECM has not yet completed their analysis of this issue. They expect to complete their analysis in the next several weeks and will supply their policy statement in a separate memorandum.

If you have any questions regarding the issues addressed in this memorandum, please contact Michael Flynn of my staff at 382-4489.

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: OCT 09 1985

SUBJECT: CERCLA Liability to Municipal Sponsors of
Household Hazardous Waste Collection Programs

FROM: Basil G. Constantelos, Director
Waste Management Division

TO: John P. Lehman, Director
Waste Management and Economics Division (WH-565)

I am requesting a definitive Agency policy statement concerning the CERCLA liability of municipal sponsors of household hazardous waste collection programs.

Under Section 8001 of RCRA, Region V awarded 17 grants, totaling $466,194, to local communities to support household hazardous waste collection programs. Several grantees (Glen Ellyn, Illinois, the Northwest Municipal Conference (suburban Chicago), and Shiawassee County, Michigan) have requested relief from long-term Superfund liability. They are hesitant to sponsor such programs without assurances from the United States Environmental Protection Agency that they will not incur long-term liability.

During the Headquarters-sponsored HSWA Conference in Washington on August 1-2, 1985, Dr. John Skinner endorsed a policy statement on this issue that had been issued by Region I. I have enclosed the letter outlining that policy, a May 4, 1984 letter from Region I Administrator Michael Deland to Ms. Dana Duxbury of the Massachussetts League of Women Voters. Region I's policy relied on Agency enforcement discretion.

I had solicited a similar policy statement from our Office of Regional Counsel (ORC) (see enclosed September 10, 1985, memo to Ms. Mary Gade). Regional Counsel's response, after conferring with Mr. Steven Leifer of the Office of General Counsel (OGC) has been one of "no exceptions." The precedent for this approach is a November 16, 1984 memo from Ms. Courtney Price (enclosed), which advises against giving "no action" assurances in enforcement matters. ORC and OGC recommended that any deviation from the Courtney Price memo would have to come from Headquarters in the form of a policy statement from the Office of Solid Waste and Emergency Response.

Because several communities have put their household hazardous waste collection plans on hold while awaiting Agency guidance, a prompt response would be greatly appreciated.

If you or your staff have any further questions, please contact Ken Westlake of my staff at FTS 886-7580.

Enclosures

EPA FORM 1320-6 (REV. 3-76)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

JUN 7 1984

MEMORANDUM

SUBJECT: Household Hazardous Waste Collection Days

/signed/ Lee M. Thomas

FROM: Lee M. Thomas
Assistant Administrator

TO: The Deputy Administrator

In response to your memorandum of May 7, 1984, I have looked into the issue of EPA support for community-wide collections of household hazardous waste. I fully agree that disposal of household hazardous waste in Subtitle C facilities is preferable to disposing of these materials in sanitary landfills and that EPA should support these programs to the greatest extent practicable.

However, I am somewhat less certain as to the extent to which EPA should become involved in the programs since they fall outside of the Agency's regulatory control under RCRA. Household wastes are specifically excluded from the definition of hazardous waste contained in 40 CFR 261.3. This exclusion unconditionally exempts household wastes from being designated as hazardous even when accumulated in quantities that would otherwise be regulated or when transported, stored, treated, disposed, recovered or reused. This exemption also applies when household wastes are mixed with wastes from small quantity generators (although when mixed with regulated quantities, the entire mixture becomes hazardous and subject to regulation). Under this system, therefore, we cannot regulate any aspect of the collection programs. Consequently, we must rely on the States to adequately regulate these programs and ensure that the materials are properly handled. From the limited information available, both the Massachusetts and Florida programs appear to be well run with an adequate degree of State oversight.

CONCURRENCES

SYMBOL	WH-562	WH/562B						
SURNAME		Clar	Cook					
DATE	5/31/84	5/31/84	5/31					

EPA Form 1320-1 (12-70)

OFFICIAL FILE COPY

With respect to EPA involvement in these programs, I believe that, under the circumstances, the responsibility for development and oversight appropriately rests with the individual States. Any support which the Agency decides to extend to such programs should be given on a case by case basis after a thorough review of the specific situation and only at the request of individual States. Absent any regulatory control should problems arise, perhaps the most appropriate course for EPA to take would be to simply provide clarification on specific issues when asked (e.g., OECM's clarification of the liability issue in Massachusetts) and to avoid actions that might unnecessarily discourage the development of such programs.

WH-562B:RAxelrad:5/18/84:S240:x382-5218

Liability is a big issue in household hazardous waste. This is our guidance on it. Use in information efforts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J. F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

May 4, 1984

Dana Duxbury
Natural Resources Director
League of Women Voters of Massachusetts
8 Winter Street
Boston, MA 02108

Dear Dana:

Thank you for your letter of April 17, 1984, concerning the commendable efforts of the League of Women Voters to encourage residential hazardous waste clean-up programs in the Commonwealth of Massachusetts. Specifically, your letter raises the question whether a town would become liable for remedial costs if there is a release to the environment of hazardous substances collected during the clean-up either from the ultimate disposal facility or during transporation to the ultimate disposal facility.

EPA has reviewed your letter and the accompanying February 9, 1984, memorandum from William F. Cass, Director, Division of Hazardous Waste, Department of Environmental Quality Engineering (DEQE), specifying DEQE's policy regarding household hazardous waste collection days. We believe the DEQE sets forth sound requirements for the safe and proper handling of hazardous wastes during this collection effort. Based on our understanding of how the program operates and assuming the town adheres to the requirements set forth in Mr. Cass's memorandum, EPA has no intention of taking an enforcement action against the town under the circumstances described in your letter.

EPA applauds the League's involvement in this effort. The establishment of these collection programs ensures the safe disposal of chemical that might otherwise be handled improperly. Further, such programs perform a valuable public education function. We support you in these endeavors and hope that household hazard waste collection days become an annual event in every community.

Sincerely yours,

Paul Keough, Acting
Michael R. Deland
Regional Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 11 1984

MEMORANDUM

SUBJECT: Potential EPA Involvement in "Household Hazardous Waste Collection Days"

FROM: Courtney M. Price
Assistant Administrator for Enforcement
and Compliance Monitoring

TO: Alvin L. Alm
Deputy Administrator

My office recently became aware of hazardous waste collection days when we were asked by Region I to consider the potential liability of communities involved in these activities. In general, I support the concept of household hazardous waste collection days and advocate EPA involvement in support of these activities.

In the specific situation presented to my office by Region I, a town in Massachusetts sought assurances from EPA that the town would not be held liable for any problems that later arose from disposal of waste through a collection day. My office has advised Region I that under the specific facts presented by Massachusetts for their household hazardous waste collection days, the Agency would not intend to take an enforcement action against the sponsoring community, if a hazard arose during transportation or later disposal (see attached letter). In these circumstances, the company collecting and transporting the wastes and the disposal facility owner or operator would be considered the responsible parties.

However, I should note that the Massachusetts program is expressly limited to collection of hazardous waste which is produced by a household as part of normal household activity. The Wall Street Journal article that was attached to your May 7, 1984 memorandum indicated that the program in Florida allowed disposal of waste from small businesses. This office's statement concerning liability only covered collection of household waste, an activity of which I fully approve. I feel we would need to look at the specific facts of a situation involving waste from small businesses to determine whether an exercise of enforcement discretion would be appropriate under the particular circumstances.

Attachment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 16 1984

OFFICE OF
ENFORCEMENT AND
COMPLIANCE MONITORING

MEMORANDUM

SUBJECT: Policy Against "No Action" Assurances

FROM: Courtney M. Price Courtney M. Price
Assistant Administrator for Enforcement
and Compliance Monitoring

TO: Assistant Administrators
Regional Administrators
General Counsel
Inspector General

RECEIVED
SEP 25 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

This memorandum reaffirms EPA policy against giving definitive assurances (written or oral) outside the context of a formal enforcement proceeding that EPA will not proceed with an enforcement response for a specific individual violation of an environmental protection statute, regulation, or other legal requirement.

"No action" promises may erode the credibility of EPA's enforcement program by creating real or perceived inequities in the Agency's treatment of the regulated community. This credibility is vital as a continuing incentive for regulated parties to comply with environmental protection requirements.

In addition, any commitment not to enforce a legal requirement against a particular regulated party may severely hamper later enforcement efforts against that party, who may claim good-faith reliance on that assurance, or against other parties who claim to be similarly situated.

This policy against definitive no action promises to parties outside the Agency applies in all contexts, including assurances requested:

- both prior to and after a violation has been committed;
- on the basis that a State or local government is responding to the violation;

2 of 4

- on the basis that revisions to the underlying legal requirement are being considered;
- on the basis that the Agency has determined that the party is not liable or has a valid defense;
- on the basis that the violation already has been corrected (or that a party has promised that it will correct the violation); or
- on the basis that the violation is not of sufficient priority to merit Agency action.

The Agency particularly must avoid no action promises relating either to violations of judicial orders, for which a court has independent enforcement authority, or to potential criminal violations, for which prosecutorial discretion rests with the United States Attorney General.

As a general rule, exceptions to this policy are warranted only

- where expressly provided by applicable statute or regulation (e.g., certain upset or bypass situations)
- in extremely unusual cases in which a no action assurance is clearly neccessary to serve the public interest (e.g., to allow action to avoid extreme risks to public health or safety, or to obtain important information for research purposes) and which no other mechanism can address adequately.

Of course, any exceptions which EPA grants must be in an area in which EPA has discretion not to act under applicable law.

This policy in no way is intended to constrain the way in which EPA discusses and coordinates enforcement plans with state or local enforcement authorities consistent with normal working relationships. To the extent that a statement of EPA's enforcement intent is necessary to help support or conclude an effective state enforcement effort, EPA can employ language such as the following:

"EPA encourages State action to resolve violations of the ______________ Act and supports the actions which __(State)__ is taking to address the violations at issue. To the extent that the State action does not satisfactorily resolve the violations, EPA may pursue its own enforcement action."

3 of 4

I am requesting that any definitive written or oral no action commitment receive the advance concurrence of my office. This was a difficult decision to reach in light of the valid concerns raised in comments on this policy statement; nevertheless, we concluded that Headquarters concurrence is important because the precedential implications of providing no action commitments can extend beyond a single Region. We will attempt to consult with the relevant program office and respond to any formal request for concurrence within 10 working days from the date we receive the request. Naturally, emergency situations can be handled orally on an expedited basis.

All instances in which an EPA official gives a no action promise must be documented in the appropriate case file. The documentation must include an explanation of the reasons justifying the no action assurance.

Finally, this policy against no action assurances does not preclude EPA from fully discussing internally the prosecutorial merit of individual cases or from exercising the discretion it has under applicable law to decide when and how to respond or not respond to a given violation, based on the Agency's normal enforcement priorities.

cc: Associate Enforcement Counsels
OECM Office Directors
Program Compliance Office Directors
Regional Enforcement Contacts

4 of 4

END